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No. XXIV. OF VOL. I., 1941. LONDON, SATURDAY, JUNE 14, 1941. Pp. 72—Price 1s.
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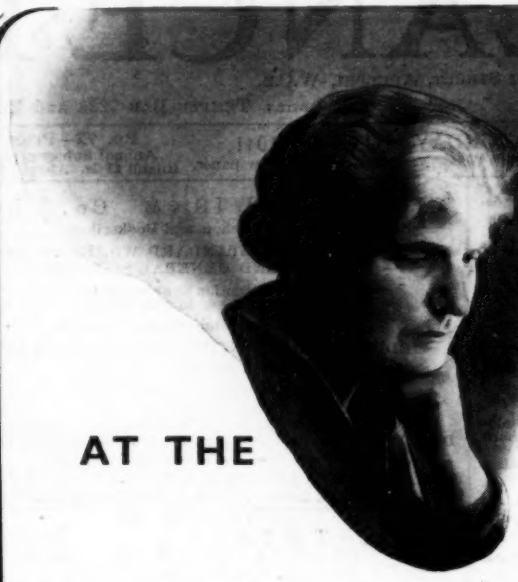

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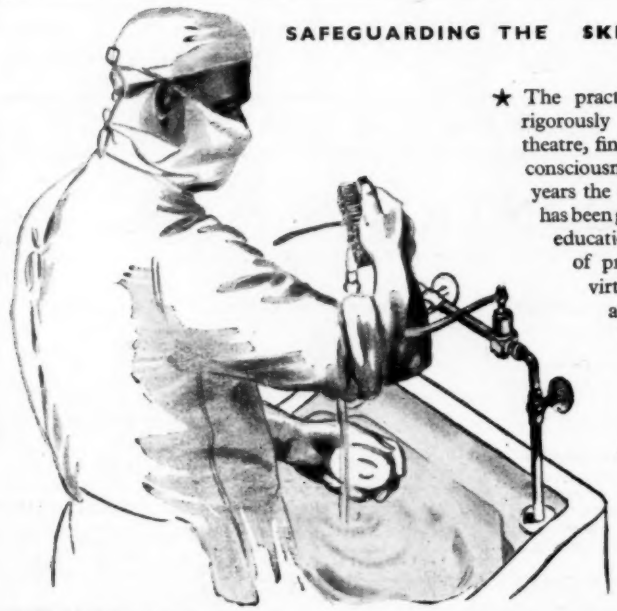

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THE relationship of the brain and the mind has exercised philosophers for centuries, but we do not yet know enough about the functions of either to describe in any detail how they are related. It may be thought, therefore, that the question is an academic one, and any further discussion of it a waste of time. Neurology and psychiatry can look back upon solid achievements, accomplished without a definition of the relationship of their respective subject matters, and there are no signs that their rate of progress is diminishing. Why, then, bother with philosophy? There is much to be said for this point of view provided that its tacit basis remains unchallenged. This is that both neurology and psychiatry should be allowed to develop and employ their own concepts as they may find necessary. This has been the recognised condition of progress in all the sciences for many years, as long as it has been found impossible to express the concepts of one science entirely in terms of another.

Recently there has been increased expression of the view that though it is not at present possible to translate cerebral function into mental happening, nevertheless the mental is potentially capable of being interpreted in terms of cerebral physiology. The effect of this belief is to subordinate psychology to neurology in interest and importance. Indeed, if it be true, the need for psychology at all is the measure of our ignorance of neurology, and, as neurological knowledge becomes more and more complete, psychology as a separate science will gradually disappear. There is nothing new in these ideas, but their recent restatement and their practical implications for the future of psychological medicine make it desirable to reconsider them. It seems possible to reduce the views which are held on the relationship of brain and mind to two—psychophysical parallelism and interactionism.

PSYCHOPHYSICAL PARALLELISM

The first view sees mental functions as running parallel with nervous functions. They may be regarded as two aspects of the same thing, one seen from within and the other from without, as it were; or the mental function may be looked on as bearing somewhat the same relation to the nervous function as a magnetic field to the electric current which it accompanies. In either case the mental function is considered as subordinate to the laws governing the nervous function. These are known through the study of neurophysiology, and are seen in their simplest form at the level of the spinal reflex arc. But the behaviour of the nervous system at higher levels, right up to the cerebral cortex, is conceived as being of the same kind as at the spinal level, and composed of reflex activity, however long its paths and however complex its facilitations and inhibitions. Consciousness, of course, is not present at the spinal level, but does accompany nervous activities at some higher levels. Now, though the reflex responses to a similar stimulus may differ at different times, they are none the less inevitable, being determined only by the stimulus and the state of the nervous system at the time. Since the activity of the nervous system at all levels is regarded as reflex, and therefore physically determined, consciousness can determine nothing: it is merely an epiphenomenon parallel with nervous activity, in terms of which it will ultimately be explained. Then not only psychology but much else will be interpreted in terms of cerebral functions. Thus Lashley [1] looks forward to a day when we shall understand "the physiologic basis of logic" because it will be "cast in terms of elementary nervous activities."

As we shall see later, psychophysical parallelism is not a neurological theory: it is a philosophical theory which happens to be held by some neurologists. It is open to two main objections, one metaphysical the other logical. The metaphysical objection was stated by Dr. Johnson two centuries ago in Rasselas with a force and conciseness which have never been bettered. The passage occurs in chapter 48, entitled "Imlac discourses on the nature of the soul," and the speaker is Imlac.

"'Matter can differ from matter only in form, density, bulk, motion and direction of motion: to which of these, however varied or combined, can consciousness be annexed? To be round or square, to be solid or fluid, to be great or little, to be moved slowly or swiftly one way or another, are modes of material existence, all equally alien from the nature of cogitation. If matter be once without thought it can only be made to think by some new modification, but all the modifications which it can admit are equally unconnected with cogitative powers.' 'But the materialists,' said the Astronomer, 'urge that matter may have qualities with which we are unacquainted.' 'He who will determine,' returned Imlac, 'against that which he knows because there may be something which he knows not; he that can set hypothetical possibility against acknowledged certainty, is not to be admitted among reasonable beings.'"

The logical objection to psychophysical parallelism can be expressed even more briefly. If the utterances of its advocates are purely reflex actions, whether attended by consciousness or not, we need not bother to consider whether they are true; for truth is not a property of reflex action. Such views are inevitable for those who hold them and our acceptance or rejection of them is equally inevitable for us. Truth has no meaning, and the theory, therefore, cannot be true.

INTERACTIONISM

So far we have not inquired whether physiology affords any support for the view that mental activities are potentially capable of explanation in terms of cerebral functions. Have the two centuries of physiological research since Johnson's day done anything to invalidate his metaphysical judgment? On this issue there is no higher court of appeal than Sherrington,[2] who has recently added to the debt which modern scientific thought owes him by expressing his views on some of the philosophical implications of neurophysiology.

"The search in that (energy) scheme," he writes, "for a scale of equivalence between energy and mental experience arrives at none. . . . The two, for all I can do, remain refractorily apart. They seem to me disparate; not mutually convertible, untranslatable the one into the other. . . . I would submit that we have to accept the correlation, and to view it as interaction; body $\longrightarrow$ mind. Macrocosm is a term with perhaps too medieval connotations for use here; replacing it by 'surround' then we get

$$\text{'surround'} \rightleftharpoons \text{body} \rightleftharpoons \text{mind.}$$

If, with Sherrington, we accept interaction as the relationship between body and mind, reflex action is represented by "surround" $\rightleftharpoons$ body, without the intervention of mind. If, in addition, mind is introduced into the cycle, presumably it has functions which cannot be performed by reflex action alone. With what are these functions concerned? Sherrington, writing his philosophy with the pen of a poet, supplies the answer.

"Mind, for anything perception can compass, goes therefore in our spatial world more ghostly than a ghost. Invisible, intangible, it is a thing not even of outline; it is not a 'thing.' It remains without sensual confirmation, and remains without it for ever. Stripped to nakedness there remains to it but itself. What then does that amount to? All that counts in life. Desire, zest, truth, love, knowledge, 'values,' and, seeking metaphor to eke out expression, hell's depth and heaven's utmost height. Naked mind."

PHYSICAL AND MENTAL CAUSES

Interactionism involves a more complex relationship between brain and mind than psychophysical parallelism,

1. Lashley, K. S. *Arch. Neurol. Psychiat.* 1938, **37**, 371.

2. Sherrington, C. S. Man on his Nature, London, 1940.

for it implies that mental disorder may arise at two levels, the physical and the mental. There is little difference of opinion about what constitutes physiogenic mental disorder. This comprises the mental symptoms of focal and diffuse lesions of the brain of all kinds, and it is increasingly probable that schizophrenia and cyclothymia are to an important extent caused by disorders of cerebral function too fine to be detected by present pathological methods.

When however we ask whether mental disorder is ever psychogenic we find a sharp cleavage of opinion. Few would say that mental factors play no part in the causation of mental illness, but many regard psychogenesis as of quite subordinate importance. Neurosis is attributed to an abnormal affective state of cerebral origin, mental experiences being merely one among many possible precipitating factors. On this view much psychotherapy and perhaps the whole of psycho-analysis and its derivatives are concerned with symptoms and not with causes.

It would be surprising if this were true. The predominant feature of the human mind is surely its immense plasticity, permitting a great variability of response to stimuli. A child may be exposed to all manner of emotional shocks and suggested fears. It would be strange indeed if it never learned the wrong answers to emotional as well as to intellectual problems, or if these early errors never persisted into adult life. What is the content of neurosis but a disorder of "desire, zest, truth, love, knowledge, 'values'"? If the normal enjoyment of these modes of being is a mental function, why need a cerebral disorder always be invoked to explain their perversion? If, on the other hand, mental experience leads to faulty emotional reactions, the interpretation and readjustment of these can be made only in terms of mental experience. The truth of this is reinforced by the light which analytical psychology, using this term in its broadest sense, has thrown upon the mental processes of normal people. The unconscious motivation of conscious acts in normal people does not require an unknown affective disorder to explain it, nor can it be explained in terms of physiological dispositions, into which, being mental, it is in Sherrington's term "untranslatable." Over a wide range the difference between neurotic and normal is one of degree only. These are the justifications for a psychotherapy based on analytical methods. This is not a defence of any particular theory of analytical psychotherapy. On the time-scale of human thought this is in its infancy. We should not be surprised if, like the Freudian infantile sexuality, it is both polymorphous and occasionally perverse.

If both mental and physical causes of mental disorder exist it may sometimes happen that either will produce a similar mental symptom and difficulties in diagnosis may thus arise. For example, a head injury, as a mental experience, may cause an anxiety neurosis, or by leading to brain injury it may cause a state of abnormal apprehensiveness of cerebral origin. It may be extremely difficult to say whether such an emotional state occurring after head injury is psychogenic, physiogenic, or both. These diagnostic difficulties, however, call for better methods of diagnosis, and do not invalidate the distinction between mental and physical causes.

The example quoted illustrates the obvious but important fact that these are not mutually exclusive. From the ætiological standpoint a psychotic or neurotic patient is like a point with two coördinates, the physical and the mental, the relative size of which must be determined individually in every case. At one extreme the physical coördinate will be large and the mental small, as in general paralysis. At the other extreme the reverse will be the case and we shall speak of the disorder as psychogenic, while still not omitting to look for physical contributory factors.

THE NOMINALIST SOLUTION

It has often been pointed out that conflicts of thought are not infrequently the outcome of clashes of temperament. Aristotelian and Platonist, realist and idealist, materialist and animist, determinist and libertarian, extrovert and introvert, cyclothyme and schizothyme, from the philosopher to the psychopath, can be regarded as variants of William James's antithetical types, the tough and the tender. To the one, things seem more fundamental than thoughts; to the other, the reverse. The tension that comes from this opposition is to be valued rather than deplored. In Blake's profound words "without contraries is no progression." Nevertheless philosophy strives to escape from the relativity of outlook conditioned by temperament, training and specialised interests. At the least it recognises that relativity, and from this awareness springs a tolerance which allows to every science its own conceptual system. In this spirit of scientific nominalism psychological medicine, without being committed to any view of the relationship of mind and brain, must maintain its autonomy as a science and its right to use whatever concepts seem to it valid and valuable, even if, like the wave and particle theories of light, they appear for the time being mutually incompatible.

The field for coöperation between neurology and psychiatry on this basis is wide, and it will be found that more concepts are applicable to both than has sometimes been thought. This is true, for example, of unconscious mind and of symbolisation. Both of these hypotheses essential to analytical psychotherapy are also inherent in neurology. Unconscious mind has been described as a contradiction in terms, but is so only if mind is first arbitrarily identified with consciousness. Sherrington [2] recognises "a grade or grades of mind which we do not experience" and stresses the essential part played in the preliminary phases of perception by "unconscious inference," a "part of the subconscious" which he distinguishes from the Freudian subconscious. Symbolisation also is of the essence of perception. "When we 'perceive' what we name 'a chair,' we are interpreting a certain group of data (modifications of the sense organs) and treating them as signs of a referent." [3] Even at the reflex level a conditioned stimulus is a sign which stands for the original stimulus. Aphasia, agnosia, hallucinations, some hysterical symptoms, phobias and paranoid delusions are all in different ways disorders of the relation between subjective and objective, symbol and referent. Such examples might be multiplied. Modern scientific philosophy makes little use of causes, which have been largely replaced by correlations. The discovery of correlations between the cerebral and the mental promises to be a more fruitful research than the attempt to explain the mind in terms of the causal laws of the body.

Although the study of brain and mind requires different and uninterchangeable concepts this in itself is no reason why neurology and psychiatry should be practised by different specialists. Indeed there are obviously great advantages in their close association, perhaps even their fusion, in training and a considerable part of practice. Nevertheless it seems likely that analytical psychotherapy will always involve a further degree of specialisation within psychiatry, demanding for what is perhaps the most exacting task in medicine special qualities of temperament, additional training and unlimited experience.

3. Ogden, C. K. and Richards, I. A. The Meaning of Meaning, London, 1927.

ANOTHER BUGGY RIDE.—In a previous book Dr. Arthur E. Hertzler showed us that he had kept his eyes and ears open during a long life spent in country practice. In "The Doctor and his Patients" (John Lane, The Bodley Head. 12*s.* 6*d.*) he offers us more of the ripe fruits of his experience. Writing, it seems, with an enviable facility, he discusses, from the point of view of that privileged observer the family doctor, the components of the family itself. His main theme is the married state and why it comes to grief so often. He contends that one of the chief causes of failure is that sexual desire is too often mistaken for love and that successful sexual congress is commonly regarded as the acme of love when, in fact, it has nothing to do with it. A satisfactory marriage, paradise earned, is only to be achieved by constant thought, effort and self-discipline. Dr. Hertzler is a realist with many a grim story to unfold, but the grimness is relieved by abundance of humour and there is no lack of wisdom among the wisecracks.

THE UNDESCENDED TESTICLE[1]

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THE importance of the partially descended testicle reaches far beyond the bounds of surgery. A boy with this malformation may be debarred from the public services, particularly the fighting services; and he runs a risk of complications, real though often grossly exaggerated in textbooks. Animals so deformed are an economic loss to the stockbreeder. One of the pioneers who studied this subject was John Hunter, who asked his brother "to take every opportunity of learning exactly the state of the testis before and after birth." From William's observations, John stated that the testicle as a rule left the abdomen and descended into the scrotum in the eighth month of fœtal life.

My own interest in the undescended testicle is chiefly concerned with the natural history. Observations have been made since 1931 on boys attending two schools: one with approximately 600 boys from 13 to 18 years of age, and the other with 400 boys aged from 9 to 18. Though the population is changing continuously it has been possible to follow the progress of most of 50 cases for periods varying from 2 to 9 years.

AGE-INCIDENCE

Grey Turner in 1937 stated that he had never been satisfied that descent occurs later than the age of 3 years; but he added "perhaps detailed information from school medical officers, who have the opportunity of examining large numbers of young boys, may justify some other conclusion." Russell Howard says that "An imperfectly descended testis will occasionally descend into the scrotum at puberty." A census of the 1000 boys under my care was taken in 1937 and again in 1940; the findings are set out in table I.

TABLE I—FINDINGS IN SCHOOLBOYS EXAMINED IN 1937 AND IN 1940

Age (yrs.)	No. of boys	No. with u.t.	Known to have had u.t. at some time	U.t. with hernia
First examination (1937)				
19–20	2	..	..	..
18	63	..	..	..
17	157	..	1 (0·6%)	..
16	196	..	1 (0·5%)	..
15	185	4 (2·2%)	7 (3·8%)	1 (0·5%)
14	187	3 (1·6%)	5 (2·7%)	2 (1·1%)
13	76	3 (4%)	3 (4%)	2 (2·3%)
12	63	1 (1·6%)	2 (3·2%)	..
11	31	..	..	..
10	12	..	..	..
9	10	..	..	..
8	2	..	..	..
Total ..	984	11 (1·1%)	19 (1·9%)	5
Second examination (1940)				
18–19	62	1* (1·6%)	4 (6·4%)	..
17	138	..	2 (1·5%)	..
16	165	..	3 (1·8%)	..
15	183	3 (1·6%)	5 (2·7%)	..
14	157	..	5 (4%)	..
13	125	2 (1·6%)	5 (4%)	..
12	49	2 (4%)	2 (4%)	..
11	45	3 (6·6%)	4 (8·8%)	..
10	28	1 (3·6%)	1 (3·6%)	..
9	20	1 (5%)	2 (10%)	..
Total ..	972	13 (1·3%)	33 (3·3%)	..
14 and over, 705		4 (0·6%)	19 (2·7%)	..
13 and under, 267		9 (3·3%)	14 (5·4%)	..

U.t. = undescended testicles.
* Operation for hernia at age of 3 years.

The first examination showed that all of 418 boys aged 16–20, and all of the smaller group of 55 under 12 years, had fully descended testicles. One boy aged 18, included in the table, had his testicle brought down by operation; 11 boys out of a group of 511 between the ages of 12 and 15 had undescended testicles, an incidence of 2·2% in the group. Comparison of the third and fourth columns shows that descent occurred on 8 occasions: spontaneously in 7 and by operation in the boy aged 17. Those in the last column are segregated because it is known that an associated hernia makes it probable that the testicle will not descend spontaneously.

TABLE II *—DETAILS OF 27 CASES OF SPONTANEOUS DESCENT OF TESTICLE

Case No.	Age at descent (yrs.)	Bilateral (B) or unilateral (U)	Onset of puberty (yr.)	Size of testicles	Remarks
1	16	B	14	Normal	Pluriglandular dystrophy. Obese.
27	16	U (R)	12½	R = ½L at 16½	
37	16	U (L)	14	L = ½R	
7	R 14½ L 15	B	15	Normal	
10	14	U (R)	15	Equal	
16	Before 14	U (R)	14	Equal	
17	14½	U (L)	15	Equal	
25	14	B	14½	Normal	Obese
30	14	U (L)	12	L = ½R at 14 L = ½R at 15½	
34	13½	U (L)	14	Equal	
35	R 14 L not desc. at 14	B now U (L)	14	Equal but small	
44	13½	U (R)	13	R = ½ L	
36	13	U (R)	Not begun at 14	Equal	Opn. for L.I.H. at age 7
19	13½	U (R)	13½	R = ½L at 13½ R = ½L at 15½	
18	13½	U	13½	Equal	
6	13	B	12½	Normal	
4	13	B	Later than 17½	Normal	Obese
3	R 12½ (opn.) L 13½ (spontaneous)	B	14½	Normal	Obese
2	R 13 L 13½	B	14		Obese. Opn. for L.I.H. at age 2
5	12	B	13½	Normal	
26	12	U (R)	12½	Equal	
28	12½	B	13½	Normal	
29	12	U (L)	11½	L = ½R at 14 Nearly equal at 15	
32	12	U (L)	12½	L = ½R at 13 Nearly equal at 14	
33	R not desc. at 14 L 12	B now U (R)	13½	L normal	
41	11	U (R)	Not begun at 11½	Equal	Obese. Opn. for R.I.H. at age 8½
9	11½	U (L)	12½		Left district when 12½

* Cases 1–24 in tables II and III have been fully reported in *Arch. Dis. Childh.* 1939, **14**, 1.

The second examination showed that the principle is maintained: undescended testicles are less common as age progresses. If puberty is taken as occurring roughly at 13–14, and the boys are separated into two groups by making the 14th birthday a dividing line, the difference is seen at once. It must be remembered that the first examination of many boys is not until puberty, which would explain why the percentage for those over 13 is less than for the younger group.

McCutcheon's statistics, based on observations for 19 years, are even more favourable to the older group. In 1656 boys over 15 he found the testicle undescended in 13 (0·8%), and of 3386 under 15 years, 315 (9·4%) had undescended testicles.

The latest age at which a testicle can descend spontaneously is not known. Sir Robert Hutchison tells me that he knew a man in whom descent occurred while he was an undergraduate at Oxford (an event duly celebrated by a party). Table II shows that puberty is a common age for spontaneous descent, and the figures confirm those of Johnson, who in a study of 31,609 boys joining a club in New York found that spontaneous descent took place in 300 of 544 with undescended testicles, and of these, 216 descended between the ages of 11 and 14.

DESCENT IN RELATION TO PUBERTY

Table II contains details of 27 boys in whom one or both testicles have descended spontaneously; table III

1. A Hunterian lecture delivered before the Royal College of Surgeons of England on Jan. 23, 1941.

those of 23 boys in whom descent has not taken place. Cases 1, 2, 3, 4, 25, 41 in table II form a small group in which some endocrine disorder was probable.

The age of descent was uncertain in case 16. Of the 10 bilateral cases (excluding case 1 but including case 3), descent occurred bilaterally in 7 and unilaterally in 2 more, in whom descent of the other testicle is a reasonable expectation. Descent before puberty was common, the average interval being a year. Case 6 was the only one in which descent took place after puberty, which occurred at 12½.

TABLE III—DETAILS OF 23 CASES WHERE DESCENT DID NOT TAKE PLACE

Case No.	Present age (yr.)	Bilateral (B) or unilateral (U)	Onset of puberty (yr.)	Remarks
12	23	U (R)	14	Atrophic testis removed at 15; opn. refused at 13½.
14	21	U (R)	13	4 courses of Pregnyl unsuccessful. Testis transposed surgically in scrotum at age 16. R = ¼L. Postop. course of pregnyl; later R = L.
11	19	U (R)	14	Testis at ext. ing. ring.
8	18	B	14	Testes at int. ing. ring.
15	18	U (R)	13	3 courses of pregnyl unsuccessful. Testis reascended ant. to ing. canal; lowered surgically. Postop. course of pregnyl. R = L.
23	18	U (R)	14	Opn. for R.I.H. at 14. Testis at ext. ing. ring.
24	18	U (R)	13	Opn. for R.F.H. at 8. Testis in sac transf. to neck of scrotum. 4 courses of pregnyl unsuccessful.
39	18	U (R)	14	Twin, 8 mths. prem.; 3 lb. at birth. Testis at ext. ing. ring.
20	17	U (R)	15	Testis at int. ing. ring.
21	17	U (R)	15	Testis at int. ing. ring. R = ¼L. Opn. for R.I.H. at 3.
22	17	U (R)	14	R.I.H. Testis in hernial sac in canal.
31	16	U (L)	starting at 16	Testis outside ext. ing. ring.
42	16	U (R)	14	Small R. testis between int. and ext. rings at 15½. Impalpable at 16.
13	15	U (L)	11½	L. testis impalpable at 15.
33†	14½	U (R)	13½	L. descended at 12; R. at ext. ing. ring.
35†	14	U (L)	just starting	R. descended at 14; L. at neck of scrotum. Course of pregnyl at 13; no effect.
47	14	U (R)	13½	Testis at ext. ing. ring.
48	14	U (R)	13	R. testis removed at 7 because undescended.
43	13	U (R)	12½	Testis at neck of scrotum.
38	12	U (R)	12	R. below ext. ing. ring.
40	12	U (R)	not started	Testis can be moved in circle of 1 in. diam. over pubic tubercle.
45	10	B	do.	R. at int. ing. ring; L. impalpable.
46	10	B	do.	Neither palpable.

† Cases 33 and 35 are included in tables II and III.

Of the 15 unilateral cases (excluding cases 18, 33, and 35) the right testicle descended in 8 and the left in 7, the average age being 13. In 10 instances this was before puberty, usually 6–12 months. In 3 of the 6 others in whom descent took place after puberty, puberty occurred early, at 11½, 12, 12½; but in the 3 others puberty was at 13, 13½ and 14 and descent at 13½, 13½ and 16 respectively. Descent at 16 and so long after puberty is exceptional. In cases 4 and 17, the teeth generally and the canines particularly were late in erupting.

POSSIBLE INDICATIONS OF FUTURE DESCENT

Obesity.—The 6 already mentioned (cases 1, 2, 3, 4, 25 and 41) were the only boys who were unnaturally fat. Bilateral descent occurred in all except case 3, in whom the surgeon had already transferred the right testicle to the left half of the scrotum. Two of the rest (cases 2 and 41) had had an operation for an inguinal hernia on the same side as the undescended testicle. In case 1, some pluriglandular dystrophy was present and descent occurred at 16, two years after the onset of puberty. In cases 2, 3, 4, 25 and 41 obesity was marked and of the Fröhlich type. In cases 1, 2 and 4 both testicles descended spontaneously and puberty followed after an interval which on the average was over a year. This sequence of events would probably have occurred in case 3 if there had been no operation. In case 4, a highly intelligent boy in whom the fat was distributed as in the female, puberty was delayed and the pubic hairs were still extremely sparse even at the age of 17½. This boy had never had nocturnal emissions or any other sign of spermatogenesis. Only in 1 boy in this group (case 41) was the testicle unilaterally undescended. He had had a right inguinal hernia cured by operation when aged 8½, and the right testicle descended when he was 11.

Johnson found Fröhlich's syndrome associated with 17 bilateral and 11 unilateral cases in his series of 544. He does not mention whether the association is a favourable sign.

Hernia or previous operation for hernia.—According to Mimpriss, of 137 patients who were operated on from 1927 to 1934 in St. Thomas's Hospital, 85% had coexistent hernial sacs. These were discovered at operation and it is improbable that they would have been found by clinical examination. Of the 48 cases reported in tables II and III only 6 had clinically recognised herniæ on the same side as an undescended testicle (cases 2, 21, 22, 23, 24 and 41); and of these the only 2 (cases 2 and 41) in whom spontaneous descent occurred had generalised obesity. In the others the testicle has remained fixed or has atrophied. In case 24 the operation was performed when the patient was aged 8. The testicle, which was in the femoral canal, had a short cord and was transposed to the top of the scrotum, but it completely atrophied. Case 36, who had a right undescended testicle, was operated on for left inguinal hernia at the age of 7. It would be expected that a testicle embedded in a hernial sac, which is itself fixed by connective tissue to the vas and surrounding structures in and out of the inguinal canal, would be incapable of movement. The sooner operation is performed the better.

Herniæ may make their appearance during treatment. Spence and Scowen (1935) noted this 5 times in 33 patients receiving hormone therapy in addition to 4 who were known to have had herniæ before treatment started. In case 22 a hernia first appeared at 14½, although the testicle had been noted on several occasions as being in the right inguinal canal. The testicle remains as it was 6 years ago.

Unilateral and bilateral non-descent.—Descent took place spontaneously in 27 boys (table II), 15 of whom had unilateral and 12 bilateral affections. Of the boys with undescended testicles (table III), only 5 were under 14, 3 with unilaterally and 2 with bilaterally arrested organs. It is best to exclude these from our present comparison, because descent later is highly probable. Of those who were 14 and over, non-descent originally was unilateral in 15 and bilateral in only 3. In case 8, hope for spontaneous descent now that the patient is 18 has been given up; one testicle has descended in both of the others (cases 33 and 35), and there is reasonable hope that the second testicle will descend in case 35 and possibly also in case 33. This establishes the fact, often quoted, that bilaterally affected testicles have much greater chances of descent than unilateral ones. We could go further and say that if arrest is bilateral non-descent at puberty is exceedingly rare.

This does not mean, however, that unilaterally undescended testicles rarely descend, for descent occurred spontaneously in 16 such cases (all ages included), compared with 15 unilateral cases aged 14 and over which failed to descend; 3 cases in the undescended group were under 14, and in these descent may still take place. The unilateral undescended testicle, uncomplicated by a clinically recognisable hernia, has an almost equal chance of descending spontaneously at about puberty or of remaining undescended.

Anatomical considerations.—In my own series, the surgeons operating on cases 14 and 15 both reported that the testicle was anterior to the inguinal canal—in other words, was ectopic. Case 19 has an interesting history: it was known that when he was 13 his right testicle was lying opposite the lower ring of the inguinal canal; at that age, while in a camp, he stretched out vigorously and got acute pain in the inguinal region, and he noticed after this that his testicle had descended. It was then only half the size of its fellow, but it has grown and is now almost of normal size.

Spence and Scowen (1938) have tried to differentiate between testicles in the inguinal canal and in the superficial inguinal position by the following criteria:

(*a*) A superficial inguinal ectopic testis lies more superficially than one situated in the inguinal canal.

(*b*) When the testis is moved upwards and outwards in the direction of the canal, the superficial inguinal ectopic testis

remains in the superficial position and becomes more obvious, whereas one situated in the canal will occupy a position deeper in the canal and thus will become less easily palpable.

(*c*) A testis situated in the canal cannot be moved towards the femoral region, whereas this may be possible in the superficial inguinal type.

(*d*) When a testis situated in the canal is moved downwards it will travel in a direct path towards the neck of the scrotum, whereas one situated in the superficial inguinal region will tend to move slightly lateral to the neck of the scrotum.

For the last two years I have studied my cases with these anatomical points in mind, and I have concluded that the first and the two last criteria are valid but not the second. Often a testicle obeying (*a*), (*c*) and (*d*), if moved upwards and outwards in the line of the canal becomes more prominent as though it cannot get further than the internal ring upwards or the external ring downwards.

It may be concluded that obesity is a favourable accompaniment, and descent usually takes place before puberty. Bilaterally non-descended testicles nearly always descend before puberty: approximately half of the unilateral cases descend at about puberty.[2] A clinically recognisable hernia or a previous operation for one is an almost certain sign that the testicle will not descend, unless it is in a fat boy. Further evidence is required to confirm Spence and Scowen's claim to differentiate between testes in the inguinal canal and the superficial inguinal ectopic testis, the latter of which in their opinion rarely descends spontaneously. I have tried to collect some evidence to prove or disprove whether prematurity is a cause of non-descent, but the war put an end to this research.

RISKS OF LEAVING THE TESTICLE UNDESCENDED

The aberrant testicle is supposed to be particularly liable to inflammation, trauma, torsion and malignant disease. Little mention is made of atrophy. In my ten years as a school medical officer, among the 600 boys who are resident there have been 7 cases of torsion of the spermatic cord and 2 of the hydatid of Morgagni; 1 of sarcoma of the testicle; 2 of large hydroceles, 1 being after mumps; and 2 of hæmorrhage from the pampiniform plexus, probably traumatic. All these have occurred in normally descended testicles. On the other hand, there have been no complications except atrophy among those with undescended testicles.

Torsion.—A long mesorchium is supposed to facilitate the torsion of undescended testicles. When torsion of an undescended testicle takes place operation is performed because of the resemblance to a strangulated hernia, a possibility not considered in the differential diagnosis if the testicle is fully descended. Torsion of the fully descended organ is fairly common, but accounts in textbooks are misleading. Nausea and vomiting are rare; the pain comes on very suddenly if the patient is awake, but is not excruciating; pyrexia is minimal. Even if untwisting, whether manually or by operation, has not been performed, the temperature is rarely above 100°F. I cannot agree with Romanis and Mitchiner (1937) that acute orchitis closely simulates torsion.

Bowen (1933) has reported 5 cases of what he calls acute idiopathic epididymo-orchitis, all of which I would have diagnosed as acute torsion, a diagnosis which he discards because the pain was not severe, there was no vomiting, and the testicle was not inverted as it must be, in Bowen's view, if the testicle can rotate on its axis. Sudden acute pain followed by a rapid increase in the size of the testicle (or of the hydatid of Morgagni or other vestigial organs) are, in my opinion, the two infallible criteria for a correct diagnosis.

In 1938, Lambert and I reported 9 cases of torsion, 4 occurring at Wellington, a school of 650 boys, in 1934–35, and 5 at Rugby, a school of 600 boys, in 1933–37. In 3 the torsion was of the hydatid of Morgagni. Since then I have seen 2 more examples of torsion of the testicle and 1 of the hydatid of Morgagni. All 3 were in patients with fully descended testicles, and I have never seen torsion in an undescended testicle.

2. My conclusions about spontaneous descent are echoed by the observations of Armstrong (1918), late M.O. to Wellington College; Marshall (1937), M.O. to Taunton School; and Bjerre (1937), M.O. to a school in Denmark.

Atrophy.—Undescended testicles certainly atrophy after puberty.

Vines studied the histology of 28 undescended testicles removed from patients past puberty, and found the greater the interval between removal and puberty the more advanced was the atrophy and fibrosis. In 12 specimens from patients aged 15–21, spermatogenesis was seen in one only. He states that "by the age of 16 well-marked atrophic changes are often present." These changes were only seen in the post-pubertal phase and not in testicles removed before or at puberty. These findings are strictly in agreement with those of Wangensteen (1935), who carried out histological examinations of biopsied material obtained from testicles when they were fixed to the thigh and when they were freed several months later. The germinal epithelium often distinctly improved, but the normal adult state was never attained. However, in one instance, where the patient died accidentally 16 months after the thigh detachment, the histological picture was not unlike the normal. Isolated areas of mature spermatogenesis were present throughout. If this fact could be substantiated by observations on others it would prove that further development is possible after the testicle is released from the thigh and placed in its normal habitat, the scrotum. A follow-up over a period of years would show how many of those operated on were fertile. Grey Turner in his paper reported a man aged 31, the father of three children, who had had a double orchidopexy when aged 15.

Vines, Wangensteen and Mimpriss agree that atrophy does not take place until after puberty, and Mimpriss (1938), in his Hunterian lecture, concluded that recovery of normal spermatogenesis was possible as late as 16–17 years. These facts are substantiated by a clinical study of testicles which have spontaneously descended (table III). All in whom bilateral descent occurred had normal testicles and in case 3 the testicle which descended spontaneously was equal to the one surgically transplanted in the scrotum. In many of the unilateral group the testicles immediately after descent were small, although most grew after descent and almost attained parity, and will no doubt function efficiently later. Several on descent compared favourably with their fellows. We are therefore on safe ground if we do not interfere until puberty, after which treatment must be carried out as soon as possible.

Malignant disease.—Neoplastic degeneration has always been a bogy to the surgeon as much as to the patient or his parents.

Pace and Cabot (1936) found 3 instances of adenocarcinoma among 24 undescended testicles, but none of these patients showed any clinical evidence of malignant disease, the diagnosis being based on the histology of the testicles examined, which in nearly all the 24 cases were removed "to facilitate the cure of a hernia"; 2 of the patients were aged 21 and 27, and the diagnosis was controversial in the third, who was 67. Vines (1935) did not observe any malignant change in 38 unilateral undescended testes, 28 of which were from patients aged 14–66, nor in 6 bilaterally undescended testicles. Coley (1919) stated that of 64 patients with undescended testicle, 12 had sarcoma. MacKenzie (1934) stated that up to 1931 he had seen no instances of malignancy in 105 cases of undescended testicle, but later that he had seen 3 examples in retained testes, in men aged 30, 48 and age not stated. Eccles (1902), on the other hand, observed 854 cases of undescended testicle without finding one with a malignant tumour, although many had attacks of inflammation, in some instances oft repeated.

I suggest that the discrepancy between these figures depends on the age at which the testicle was removed. The older the patient the greater is the risk of the testicle becoming malignant. Transplantation into the scrotum does not necessarily remove this liability. Chevassu and Carillon (1938) recorded 5 cases of neoplasm in artificially descended testicles, and Chauvin (1938) has reported others, which are summarised in table IV.

Nearly all the neoplasms were seminomata. No surgeon has, to my knowledge, followed up his cases to see what proportion of those in whom operation was apparently successful have developed abnormalities in later life. Nevertheless, the 12 examples published by the French surgeons show that even early operation is no absolute guarantee against subsequent neoplastic

degeneration. Though the interval between descent and neoplasmic change was longest in those operated on before puberty, the average age of onset of the neoplasm was 26, compared with 31 in those who were operated on later. Undue emphasis need not be laid on this comparison; but the advisability of any operation after puberty, except orchidectomy, is questionable.

TABLE IV—INCIDENCE OF NEOPLASMS IN PATIENTS OPERATED ON BEFORE AND AFTER PUBERTY

BEFORE PUBERTY		AFTER PUBERTY	
Age at operation	Age when neoplasm appeared	Age at operation	Age when neoplasm appeared
8	30	15	15
8	36	20	25
11	20	20	35
13	20	26	26
13	23	26	42
		27	43
		32	33

The risks of torsion, trauma and inflammation, then, are not great, and probably no greater than in the fully descended testicle. The risk of malignant degeneration seems a real one, but it may not be less if the testicle has been surgically lowered into the scrotum. Atrophy is a real danger and no undescended testicle should be left untreated for more than a year after puberty.

The patients do not suffer constitutionally from their deformity. Except for those with general adiposity and with herniæ, they differ, on the average, in no way from their fellows. Wessel (1938–39) considered 8–11 years was the ideal age for operation and deprecated postponing it until puberty because he noticed an access of athletic ability after operation. This may have been wishful thinking, and I certainly have not noticed it. Nor does the undescended testicle have any effect on the intelligence. Several of my cases were scholars, some were superannuated, but in most the mental age was the same as the chronological.

RÔLE OF SURGERY AND ENDOCRINOLOGY

Bigler and others (1938) summarised eighteen reports of the treatment of undescended testicles by hormones, and found that of 267 testicles treated 176, or 65%, descended completely. The authors of some of these reports were probably prompted to publish them because of their high proportion of successes; others may refrain because of their low proportion. Often details of treatment are missing, and it will be more helpful if only those results are considered where precise information is given. Such a series is that of Spence and Scowen (1938), in all of whose cases adequate treatment was given (at least 500 units twice a week, usually for 6 months and in some instances for over a year). Table v is modified from Spence's.

Spence and Scowen excluded from their series those they considered in the superficial inguinal position; I have excluded the retractile tests, for Spence and Scowen themselves admit that they would descend normally. Most of their patients were young and success was minimal with patients over 17. Spence and Scowen have added greatly to our knowledge, but since their publication of 1935 they have become more sober in their claims for hormone therapy (1938). The conclusion is growing that those testicles which descend with hormone therapy are usually those that descend spontaneously. Only half of the bilateral and a third of the unilateral undescended testicles were brought down by hormone therapy. These results compare unfavourably with those where no therapy was given until puberty.

Although operation should be postponed until puberty, delay after that is fatal to the testicle. The difficulty is to persuade the patient's parent of this. Only 3 of the parents of the boys who have passed puberty have consented to operation.

In case 12, an atrophic testicle was removed over a year after the onset of puberty, when operation was first advised. He received no endocrine therapy. In the 2 others (cases 14 and 15), the testicles were both ectopic, having reascended anteriorly to the inguinal canal. Both had received copious endocrine therapy, which had increased the size of the testicle, and at operation one was transposed through the scrotal septum and the other was brought down into the scrotum with satisfactory results. In both, the testicles have attained parity with their fellows.

Table III shows that the testicle is usually arrested at the external inguinal ring (7), at the internal inguinal ring (4), or at the neck of the scrotum (4); in only 1 case was the testicle between the rings. These clinical observations bear out the surgeon's findings at operation.

Spence (1938) reported some obstruction in 6 patients who were operated on after unsuccessful hormone therapy. In all of these the testis had been palpable through the skin before operation. In one the intercolumnar fascia stretched as a firm sheet completely across the external inguinal ring forming a barrier; in another the testis lay just inside the external ring and was firmly held by adhesions in the inguinal canal; in a third, the testis lay near the internal ring, where it was held by fibrous tissue. Thompson and Heckel (1939) have also shown that anatomical peculiarities are common. Of their 38 patients, 12 had bilateral and 26 unilateral undescended testicles. Often the testicles descended spontaneously, but 11 patients whose testicles did not descend were treated surgically. In all of these, fibrous bands prevented descent; in addition, the structures attached to the cord were often short, in 4 the peritoneal process was abnormally directed, and in one the external ring was absent.

These recent observations confirm John Hunter's experience: "The place where the ligament is most confined is the ring in the tendon of the external oblique muscle: and accordingly I think one sees more men who have one testis or both lodged immediately within the tendon of that muscle than those who have one or both still included in the cavity of the abdomen."

TABLE V

Position of testicle	No. of testes	Descent	%
Bilateral (66 testicles)			
Retractile	28	28	100
Inguinal canal movable but not in scrotum	23	13	56
In inguinal canal and not freely movable	3	0	0
In pubic region, movable but not in scrotum	1	1	100
Not palpable	11	4	36
Total, excluding retractile	38	18	47
Unilateral (32 testes)			
Retractile	5	5	100
In inguinal canal, movable but not into scrotum	18	7	39
In inguinal canal and not freely movable	3	1	33
In pubic region, movable but not into scrotum	2	1	50
In pubic region and movable into upper scrotum	1	0	0
In upper scrotum	1	0	0
Not palpable	2	0	0
Total, excluding retractile	27	9	33

The conclusion is inevitable that the testicle which does not descend at puberty is prevented from doing so by anatomical obstruction. The surgeon's task, at first apparently a difficult one, is made easier by hormone therapy. Under this treatment the testicle undoubtedly hypertrophies, as can be judged clinically, and coincident with this is an increase of the circulation, fragile spermatic blood-vessels becoming able to withstand the strain of being stretched when the testicle is inserted into the scrotum. Usually one post-operative course of hormone therapy will cause the testicle to enlarge further and maintain its new position. Puberty is the ideal age for operation, for at this time there is an access of gonadotropic substances in circulation.

SUMMARY

Undescended testicles associated with clinical herniæ should be treated surgically; others should be given the chance to descend spontaneously at puberty. If they fail to do so, operation should be performed without

delay. A preliminary course of hormone therapy will not often cause descent but will make operation easier. Most of the testicles which do not descend spontaneously will be found to be ectopic or to have anatomical obstructions.

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REDUCTION OF DUST-BORNE BACTERIA IN A WARD BY TREATING FLOOR AND BEDCLOTHES

BY

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IN a previous paper (van den Ende, Edward and Lush 1941) laboratory investigations on the dust-laying effect of liquid paraffin on textiles were described. The experiment reported here was performed to determine whether the treatment of bedclothes by the method described would significantly reduce the number of dust-borne organisms in the air of hospital wards.

The surgical ward in which the experiment was carried out (fig. 1) consists of four subdivisions, a first and second female ward containing 12 and 11 beds respectively, and two male wards containing 16 beds each. The distance between beds is approximately a yard. Before the experiment was begun the floor, which is of pine planks, had been treated by occasional scrubbing and regular waxing with a standard floor polish; it is swept with a soft brush thrice daily. The four divisions of the ward intercommunicate by ordinary doors.

The windows of the ward are protected outside by brick anti-blast screens which reach to about two-thirds of their height. Each window is provided with a series of horizontally hinged inside blackout screens which are raised and lowered at morning and night and whenever an air-raid alert is sounded. A few windows were opened at irregular times during the experiment. About a third of the patients in the ward were ambulant. Each bed is provided with a mattress, three blankets, two sheets, a thick cotton counterpane, and pillows. Before the beginning of the experiment, bedding was laundered in the hospital laundry in the usual way. It received no special treatment.

Two plate-exposing machines were used which exposed one plate for 15 min. in each hour, the plates being placed on a revolving table so that each exposure happens in the same place. The machines were placed nearly in the centre of the two female wards, as indicated in fig. 1. Each machine was surrounded by an openwork screen made of thick paper-board slats nailed on wooden uprights, measuring a yard square and a yard high. The object of this was to prevent passers-by from rubbing against the plates. Each day's run was begun at 7 A.M. and ended after 10 P.M. The plates used were 5% horse-blood Hedley Wright agar which had been dried in the incubator before use. Colonies were counted after aerobic incubation at 37° C. for 48 hours. Possible hæmolytic streptococcus colonies were picked to blood agar, tested for soluble hæmolysin production, and sent to Dr. Frederick Griffith, who kindly typed them.

PRELIMINARY TESTS

Two 24-hour runs in the male wards showed that these were not suitable for the experiment, for the curves obtained were very irregular and apparently unrelated

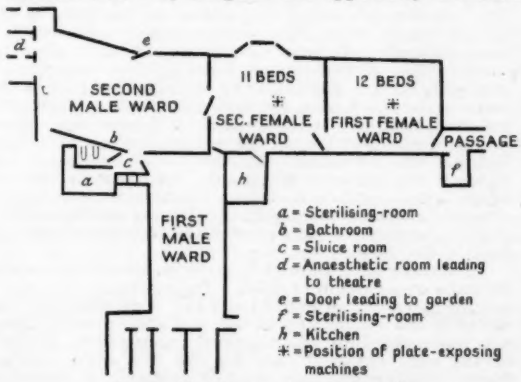

FIG. 1—Sketch map of surgical ward.

to the daily ward routine. This was probably because the machines were placed in draughty places, and possibly because a large number of the male patients were nearly convalescent soldiers of considerable activity and some mechanical curiosity.

It was therefore decided to carry out the experiment in the second female ward (11 beds), using the first female ward as a control. Accordingly, on Jan. 16 and 17, before either the floors or the bedding had been treated, the machines were run. The plate-counts for these two days in the second female ward are recorded in fig. 2; the curves for the first female ward were similar. Nothing untoward happened to the ward routine, and it is probably fair to accept these two days as reliable samples. One point of interest emerges from a study of the 8 colonies of hæmolytic streptococci obtained. Their types were: 1 colony each of types 13, 11 and 8; 1 colony of a group-G streptococcus; 2 colonies of unidentified group-A streptococcus; and 2 colonies of type 4/24. This last type (4/24) had been introduced into the male wards on Jan. 12, five days before, on 5 patients with burns of the face and hands, all of whom were heavily infected, and who by the 15th had developed heavy infections of their throats. Since this type of streptococcus had not previously been encountered in the ward, and was not then or since found in the wounds or throats of any of the female patients, its presence in the dust of the female ward probably indicates that there is a fairly free interchange of dust between the different divisions of the ward. Both of the colonies obtained on the 16th and 17th were on plates exposed in the second female ward, which communicates with both of the male wards by simple doors. A colony of the same streptococcus was obtained from the air of the first female ward on Feb. 6. The plate-counts for these first two days show definite maxima at the hours of bedmaking and floor-sweeping.

TREATMENT OF FLOOR AND BEDDING

Floor—On Feb. 4 the floor in the second female ward was scrubbed, and on the 5th it was oiled with spindle oil. On the 6th the sampling machines were run in both female wards. The counts for this run were little if at all below those of the preliminary run; and there was no significant difference between the first ward, which had not been oiled, and the second which had.

Bedding.—On the 6th, blankets, sheets, counterpanes and pillow-cases sufficient for the 11 beds in the second female ward were treated with 30% liquid paraffin in "white spirit" in the hospital laundry. Fifteen gallons of the spirit-paraffin mixture was placed in a slate tank. Each of the articles of bedding (all of which were clean) was soaked, wrung out by hand, and spun in a hydro-extractor. The excess fluid which was spun out was recovered and returned to the tank. The bedding was dried in a steam-heated drying machine.

Sheets and pillow-cases were damped with water and then "ironed" on a steam calender, which had a steam-pressure in the roller of about 8 lb. and in the "bed" of 75 lb.

On Feb. 9, the bedding in both female wards was changed. The beds in the first ward (control) received ordinary clean bedding laundered in the normal way. The paraffined bedding was placed on the beds in the second female ward. The only comment following this from patients and nurses was that for 24 hours after the introduction of the treated bedding there was a pronounced (but not unpleasant) smell of white spirit in the ward at the times when the beds were made. There was no complaint of discomfort, or "dampness." It is doubtful whether many of the patients realised that their bedding was abnormal. To the casual eye, nose and touch it did not seem abnormal. At the most, several of the nurses noticed a slight greasiness of their fingers after the morning's bedmaking. During the succeeding days, some nurses commented on the scarcity of fluff and dust in the ward.

Four days were allowed to pass, so that there might be some equalisation of dust. The machines were then run for two days, on Feb. 13 and 14. Unfortunately the motor of one machine burnt out, and since repair in time was impossible only one machine was available, so that curves were obtained only for the test ward (second female ward); the only control available is therefore the set of curves obtained on Jan. 16 and 17. The counts for Feb. 13 and 14 are shown in fig. 3. They show a general reduction in air bacteria, and a flattening of the peaks corresponding to bedmaking and sweeping.

DISCUSSION

The small numbers of streptococci recovered from the air during these experiments suggest that in these wards aerial transmission of streptococci, whether by dust or droplets, was probably not a significant factor in the cross-infection which occurred. Furthermore, the small number of hæmolytic streptococci recovered made it impossible to use them as an index of the efficacy of the dust-laying methods under test. It is hoped that there will be opportunities of testing these methods in scarlet-fever wards where the numbers of streptococci which can be recovered from the air are usually much higher.

From the results of our experiments, which were based on the total numbers of dust-borne organisms, it can

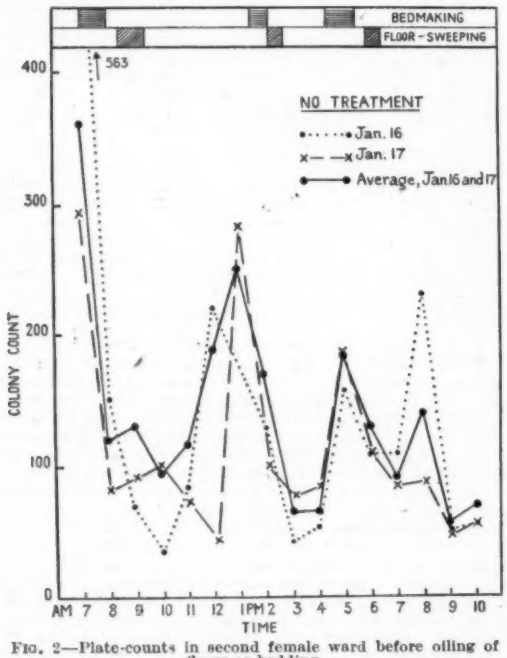

FIG. 2—Plate-counts in second female ward before oiling of floors or bedding.

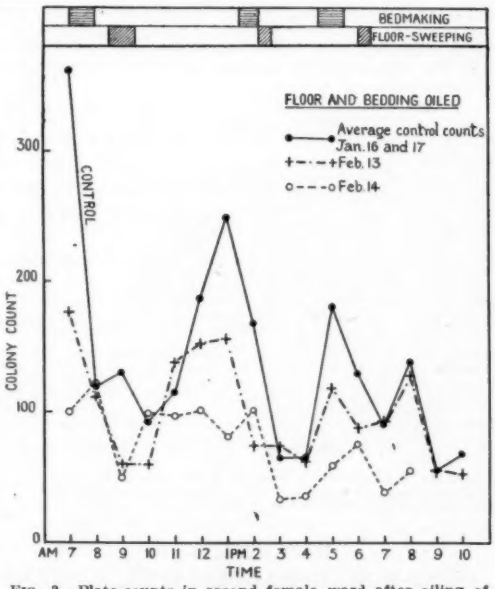

FIG. 3—Plate-counts in second female ward after oiling of floor and bedclothes.

reasonably be concluded that the oiling of the floors alone did not significantly reduce the number of dust-borne organisms in the air. The treatment of both floor and bedclothes, on the other hand, resulted in a definite reduction in the number of bacteria which could be recovered throughout the day. The favourable results of this investigation have been obtained in spite of the fact that interchange of dust occurs with the adjacent sections of the ward. Evidence for this is the spread of the streptococcus type 4/24 from the male to the female sections. Moreover, the lids of the machine used to expose the petri dishes collect a certain amount of dust, the deposition of which on subsequent plates was difficult to avoid. If it had been possible to avoid these sources of error, and perhaps some other minor uncontrolled sources of dust, such as the blackout screens and window-ledges, the results both for floor-oiling and for the treated bedding would probably have been more striking. It is evident that the wards in which the experiments were performed were not ideal for the purpose, chiefly because of the free interchange of dust between them. Under the circumstances, the observed reduction of air bacteria shows that the method is worthy of a repeated and more extensive trial under more controlled conditions.

It must be pointed out that the method of applying the oil from solution in white spirit is not at present practicable with the usual equipment available in hospital laundries. In fact, these trials have made it more obvious that further research on suitable methods of application of liquid paraffin is necessary.

SUMMARY

It has been shown that the treatment of bedclothes with liquid paraffin will reduce the number of dust-borne organisms in the air of a hospital ward.

The great increase in the number of bacteria in the air which usually accompanies bed-making is almost completely eliminated.

The treatment consists of the application of a 30% solution of liquid paraffin in white spirit.

The amount of oil required to lay the dust is small and does not result in excessive greasiness.

This experiment was made possible by the coöperation of the medical superintendent and the matron of the hospital, the laundress Miss E. A. Peacock; and the sister and nurses of the ward. Our thanks are due to Mr. R. Mowlem for permission to carry out the experiment in his ward. We are grateful also to Mr. E. Schuster, D.Sc., for the loan of the plate-exposing machines which he designed.

AN OUTBREAK OF POLIOMYELITIS

USE OF SULPHAPYRIDINE AND CONVALESCENT SERUM IN TREATMENT

BY

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IN the early part of the summer of 1940 there was a moderately severe epidemic of poliomyelitis in Harrogate, with a spread of the disease in gradually diminishing numbers to the surrounding urban and rural districts lying within about fifteen miles. During the first four months of the epidemic, June–August, there were 75 cases in the borough and about 30 in the areas around. The epidemic began gradually, only one or two cases developing in the first week. The health of the community in general was good, there had been no serious epidemic of other infectious disease, and the weather had been congenial for several weeks before the outbreak began.

CLINICAL FINDINGS

Symptoms.—In more than half the cases seen by one of us (S. M.) the onset was insidious; commonly there was pain in the neck, across the shoulder girdle and down the spine, followed by a period of malaise, sore throat, slight temperature, stiffness of neck muscles, headache and extreme irritability lasting a week or more.

During this period the posture assumed when the patient sat up in bed was often characteristic; there was difficulty in maintaining the head and trunk erect and almost invariably the patient rested the elbows on the bed to gain additional support. Salivation, nausea and vomiting were common, together with some difficulty in phonation; nearly all the patients had a strawberry-like tongue. The temperature varied; in several cases fever was slight and transient, whereas in others it reached 103° F. A positive Kernig's sign was almost the rule.

The presence or absence of tendon responses depended on the time when the examination was made, reflexes often being exaggerated in the very early stage and absent later. Cases developing severe paralysis usually ran a high initial temperature for several days before the onset of paralysis.

Age-incidence.—The first case in Harrogate was in an adult aged 26, but on analysis four-fifths of the 75 cases in the borough were in children under fifteen. There were 2 cases in children under one year, 1 child being only three months old when attacked; there was only 1 case over thirty.

Age (yr.)	No. of cases.	Age (yr.)	No. of cases.
Under 1	2	16–20	11
1– 5	14	21–30	3
6–10	24	Over 31	1
11–15	20		

Cerebrospinal fluid.—During the epidemic we examined the cerebrospinal fluid in 55 cases in which the diagnosis of poliomyelitis was established. As a rule the fluid was examined within a week of the onset. In only 9 cases was there a rise in the protein content beyond 0·04 mg. per 100 c.cm.; there was a corresponding rise in the globulin percentage. The white-cell content varied widely: in 16 of the fluids examined there were 4 or less white cells per c.mm.; the highest cell-count was 250 cells per c.mm. In the cases seen early almost all the cells found were lymphocytes, whether or not there was an increase in the cellular content; later polynuclear cells appeared, though never to the same extent as the lymphocytes.

The initial white-cell counts were as follows:—

Cell-count per c.mm.	No. of cases	Cell-count per c.mm.	No. of cases.
0–4	16	51–100	4
5–10	12	101–200	3
11–50	15	Above 200 ..	2

In 14 cases there was a white-cell count under 4 per c.mm. and a protein content of under 0·04 mg. per 100 c.cm. In most of these the fluid was examined early in the attack and examinations made later showed in several an increase in either the cell-count or protein or both.

Paralysis as a rule developed towards the end of the first week of illness, though in several cases it did not appear until the second week, and in one or two only in the third week. In most of the cases in the earlier part of the series, when treatment was largely symptomatic, paralysis was progressive for a few days; in the series generally it was relatively more severe with each increasing age-group. The severest residual paralysis in the series was in the oldest patient attacked, but in this case no specific treatment had been instituted until the paralysis was well advanced. Our case-notes show that there may be a considerable degree of early initial paralysis without any residual paralysis if energetic measures are taken early.

It is difficult to define with any degree of uniformity an exact standard for the severity of the residual paralysis, as many factors are involved in each case. Cases may be classified into the following groups:—

(*a*) No residual paralysis.
(*b*) Negligible paralysis unlikely to impair wage-earning capacity.
(*c*) Paralysis likely to impair general efficiency but not render the patient wholly unfit to follow an occupation.
(*d*) Paralysis producing complete incapacity.

DIAGNOSIS AND TREATMENT

During an epidemic any illness in a child with pyrexia without obvious cause should be treated as poliomyelitis. Occasionally the meningeal symptoms may be so severe as to suggest meningitis or meningism associated with a fulminating pneumonia or other acute disease in children. In such cases examination of the cerebrospinal fluid usually helps, but it may give normal findings in the early stages of poliomyelitis (Bower and Meals 1939) and occasionally of cerebrospinal fever. In tuberculous meningitis the examination is usually diagnostic. Often the diagnosis must be based on little more than clinical impressions if it is to be made early. Once paralysis has supervened the diagnosis is clear.

Symptomatic treatment.—Once the diagnosis is suspected the patient must be put at complete rest in bed. A light stimulating diet is indicated; fluids should be given freely and should include an adequate supply of fruit juices rich in vitamin C. Restlessness, when present, is as a rule well controlled by a mixture of bromide and chloral. In the early stages bowel action should be regulated by enemata if necessary. Care of the skin over pressure-points is particularly important, since bed-sores are liable to develop where there is paralysis or interference with skin nutrition. During convalescence the diet should be generous and include concentrated vitamins and cod-liver oil.

Care of paralysis.—Whenever evidence of muscle weakness or paralysis is found, suitable support must be improvised. Much can be done with sandbags, pillows, slings, and cradles; plaster splints should be applied early where required. The criterion for splinting should be the inability of the weakened muscle or group of muscles to carry out a full range of movements. Careful massage can be safely undertaken when the temperature has been normal for a week. In many cases a combination of massage and ultraviolet light is beneficial.

Sulphapyridine and convalescent serum.—At the outbreak of the epidemic treatment was largely symptomatic, and close attention was paid to splinting and other means of support. The earlier results were disquieting; some cases ended fatally, and in others the paralysis extended considerably in spite of treatment. Later in the epidemic sulphapyridine was tried, at first alone and later in combination with convalescent poliomyelitis serum; the response seemed to show a definite advance, but in a disease like poliomyelitis when the variants are protean caution must be shown in interpreting results.

Towards the end of the epidemic, we adopted the following modifications in sulphapyridine and serum therapy:

1. Cases showing malaise or indefinite pyrexia without apparent cause were given sulphapyridine by mouth in appropriate doses and kept under close observation.

2. Cases showing the earlier manifestations of the infection received in addition convalescent poliomyelitis serum.

Initially 2 g. of sulphapyridine by mouth and 20 c.cm. of convalescent serum intramuscularly were given, and 1 g. of sulphapyridine was repeated four-hourly until the temperature settled unless there were serious contra-indications. Occasionally the serum was repeated once or twice.

3. Cases presenting acute symptoms, where paralysis was impending or had already developed, were given initially 2 or 3 g. of sulphapyridine soluble in physiological saline intravenously at the earliest moment possible together with 20 c.cm. of convalescent serum intramuscularly. The sulphapyridine soluble was repeated four-hourly until 8–10 g. had been given. A second dose of 20 c.cm. of the serum was given eight to ten hours after the first. Next day sulphapyridine soluble and serum were repeated; in the more severe cases further injections were given on the third day, but usually they were not required. Modification for children was made according to age.

Since this procedure has been adopted we have had no serious extension of paralysis in any case, nor have there been any deaths; such reactions as occurred were negligible.

ANALYSES OF CASES

We have been able to review the case-records of 48 cases. These include cases admitted to the Harrogate General Hospital under the care of one of us (S. M.) as well as cases seen in private; others under the care of Dr. L. J. Prosser in Harrogate General Hospital and Dr. C. H. Greenwood in the Ripon Isolation Hospital, both of whom gave us an opportunity of collaborating in treatment; and a group of school-children under the care of Dr. R. G. Mathews of Kirkby Lonsdale. The cases fall fairly equally into three groups.

(*a*) *Those treated symptomatically* with due attention to splinting and provision of suitable support (18 cases). In this group there was one death, and another patient developed such severe paralysis that she is incapable of following any occupation: 4 of the others are so severely crippled that their general usefulness is likely to be seriously impaired. In 6 others the paralysis is slight and not likely to lessen seriously their wage-earning capacity; the remaining 6 either escaped paralysis completely or developed only a negligible amount.

(*b*) *Those receiving sulphapyridine* in addition to symptomatic and other treatment (14 cases). Amongst these one patient died on the third day of treatment, the patient having received an initial dose of 2 g. of sulphapyridine and afterwards 1 g. four-hourly for three days; though seriously ill when admitted to hospital there was no indication that the case would end fatally. In 3 others the paralysis extended considerably while under treatment, and these were left with a moderate degree of paralysis. In the remaining 10 there was little or no paralysis (cf. Wagner 1939, Rivers 1939 and Rhett 1940).

(*c*) *Those receiving both sulphapyridine and convalescent poliomyelitis serum* in addition to other treatment (16 cases). This group included many of the more seriously ill cases, some of them being so severe when first seen that little hope of survival was entertained. In 3 of the group paralysis had already been present two or three days before treatment was begun, and it was unlikely that much benefit could be obtained; in these there was no further extension of paralysis. In 2 other cases the paralysis was rapidly extending when first seen, and in one certainly no hope of survival was entertained; both of these made excellent recoveries with amazingly little residual paralysis. The remaining 11 cases made an excellent recovery. It was generally agreed that the pyrexial period was shortened and the toxicity lessened by the combined treatment. Four cases were described in our previous communication (Miller and Wray 1940) and we append a further case-history from this group.

Male, aged 5 years; seen on the evening of the fourth day of illness. Child had returned home from school three days before with headache and had been unable to go to school on the following day; off food; restless. Worse on the next day with slight fever followed by a very restless night, with repeated vomiting attacks. On the morning of the fourth day the temperature was 99·6° F. and the child very toxic, but no diagnostic signs were present. Late in the afternoon he became worse, and in the evening the temperature was 102° F., he was stuporous and irritable, severe frontal headache was present, head retraction was obvious, and there was pain at back of neck. He was unable to support head when asked to sit up in bed; there was moderate amount of paresis of right arm and left leg; superficial reflexes were present, the left knee-jerk being very active; Kernig's sign positive in both legs. Though only five years old the child was given 1 g. sulphapyridine soluble intravenously in 20 c.cm. of saline with 15 c.cm. of convalescent poliomyelitis serum intramuscularly, followed by one sulphapyridine tablet (0·5 g.) four-hourly and fluids freely. On the following day the child was much better; temperature 99° F., both morning and evening. Next day temperature became normal, and his condition was satisfactory; left knee-jerk was now elicited only with great difficulty, the right being the same as when first examined. There was no further extension of paralysis. Further progress was uneventful, the child being left for a time with slight residual weakness of right arm and left leg. When he was examined two months later it was almost impossible to detect any evidence of residual paralysis and the reflexes had returned.

In none of the cases treated with sulphapyridine and serum has there been any serious constitutional upset. A careful watch has been kept on the cytology of the blood and nothing untoward has been noted; there has been little gastric disturbance and the serum gave rise to no reactions.

DISCUSSION

The underlying thesis in treating poliomyelitis with sulphapyridine and convalescent serum lies in the fact that the virus of poliomyelitis is probably an organism of feeble resistance. This is suggested by (1) the relatively low fatality-rate; even the deaths which occur are largely due to the site involved, the anterior-horn cells controlling the muscles of respiration; and (2) the short duration of the acute generalised symptoms in those attacked. From a study of the clinical aspect of the onset and early stages of the attack, coupled with the findings in the cerebrospinal fluid examinations, we have little doubt that initially the infection is systemic and later the anterior-horn cells are attacked because of the selective neurotropic affinity of the poliomyelitic virus for these cells. On this basis the early clinical picture of the generalised toxæmia is easily explained.

Since the disease is largely confined to children and adolescents, and since current literature indicates that the virus is widespread (Toomey 1937, Trask and Paul 1938) the majority of adults have probably acquired complete immunity to the disease.

By the use of intravenous therapy a massive concentration of sulphapyridine soluble in the blood and body tissues can be readily attained and to this we attribute the rapid curtailment of infection and of the spread of paralysis. The convalescent serum, we believe, has a dual purpose: it enhances the action of the sulphapyridine in a way analogous to that in which specific pneumococcal serum acts in pneumonia; and in addition (from clinical observation) we have little doubt that the serum contains antibodies which help to neutralise the existing toxins and destroy the virus.

In conclusion, we stress the necessity for early diagnosis. In an epidemic many cases of the milder type will never be seen by the medical practitioner, but in those seen much can be done to avert paralysis if appropriate treatment is begun early.

SUMMARY

An outbreak of poliomyelitis of moderate severity is reported, in which the incidence was predominantly among the young. With sulphapyridine, either alone or combined with convalescent poliomyelitis serum, together with other appropriate treatment, the attack was rapidly controlled. The importance of early diagnosis is stressed.

We are indebted to Dr. G. P. Wallace, house-physician at the Harrogate General Hospital, and Mr. S. F. Elcoate, senior laboratory assistant, for their assistance.

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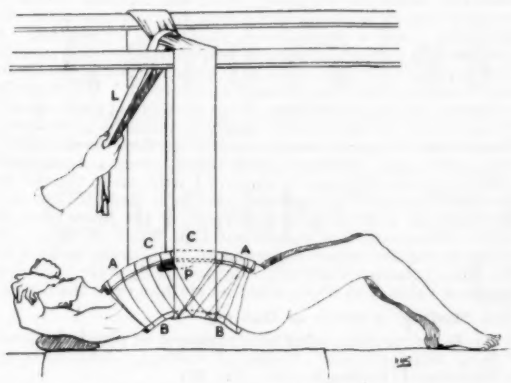
FIXATION OF FRACTURED VERTEBRÆ

By H. H. Greenwood, M.B. Lond. and Leeds, F.R.C.S.
LATELY SURGEON TO THREE COUNTIES WAR HOSPITAL, ARLESEY

Fractures of the thoracic and lumbar vertebræ are, with rare exceptions, flexion fractures, and demand for their treatment fixation of the spinal column by a plaster-of-paris jacket in hyperextension. The two-table method, wherein the patient lies prone, with his elbows on the edge of one table, his thighs on a second table, and his body swung like a hammock between the two is admirable provided (1) the patient is fairly strong physically and able to coöperate intelligently; (2) the fractured spine is the sole lesion, uncomplicated by injury to the cord, or by some concomitant injury such as fracture of the skull or wounds elsewhere; and (3) the patient is sane. In complicated injuries and insane patients some plan in which the patient lies supine, either supported by a frame or by a sling with block and pulley, is adopted. There is a simpler method which needs only a double Balkan beam, a table, and three helpers. The diagram illustrates the method.

The anterior broad plaster slab, A × A, reaches from the suprasternal notch to the symphysis pubis (which it overlays), and the posterior slab, BB, reaches from the lower angle of the scapula in lumbar fractures, or slightly higher in thoracic fractures, to the upper end of the cleft of the nates—that is, over the sacrum. These slabs are prepared dry. The



posterior slab is then wetted and applied; over this a broad (6–8 in. wide) double domette bandage is carried as a sling over the horizontal bars of a double Balkan beam, the ends knotted firmly and over the knot a loop (L) is held by an assistant. The body is then raised until buttocks and shoulders swing clear of the table. The neck can be supported by a small pillow to prevent irksome extension of the head, and the feet rest on the end of the table. The anterior slab is then wetted and applied with a stomach-pad (P) beneath it. Two plasterers, one working from below and the other from above, then complete the casing as shown, until the limit imposed by the domette sling is reached. By this time the anterior slab has set sufficiently to allow of the safe withdrawal of the stomach pad, the posterior slab is firm enough to retain its shape, and the sling can be cut across at CC, the lower ends now being incorporated in more turns of the plaster bandages until the gap is filled. It is important that the back be supported when this is done and the body lowered gently to the table.

This method is effective, needs neither apparatus nor the coöperation of the patient, and is specially suited to thoracic fractures. The first case in which I used this method was an airman with a fracture of the lumbar spine and a fracture of the skull. I have since found it eminently suitable for mental patients who sustain fractures of the spine during the convulsive treatment of schizophrenia, or from epileptic convulsions.

Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the Section of Psychiatry on May 27, with Dr. C. P. Symonds, the president, in the chair, a discussion on

Metabolic Changes in Periodic Catatonia

was opened by Dr. A. B. Stokes. Metabolic investigations in schizophrenia have, he said, been disappointing, perhaps because the material is far from homogeneous. Gjessing selected a small field where the case material showed constancy in many dramatic qualities, and followed single cases through many months with daily biochemical and physiological investigations. These cases, classified as periodic catatonia, are characterised by repeated attacks of stupor or excitement which come on and disappear rapidly; in the intervals the patient is "normal," though showing impairment of mental faculties with lack of volition and critical ability, poverty of ideation, emotional flattening and mannerisms. Gjessing found a phasic variation in total nitrogen balance and in autonomic function corresponding with this periodic change. Such cases are called synchronous syntonic to distinguish them from others in which the phasic nature of the mental disturbances and physiological functions is blurred, asynchronous and asyntonic. There are two types: in type A the excitement or stupor occurs during a period of nitrogen excretion; in type C it occurs during a period of nitrogen retention. No intermediate type B has been discovered. Gjessing maintained that the nitrogen phasic change is of primary importance. He controlled his patients' environment and the conditions of his investigation most strictly; and he found that in type A the mental changes appear after the onset of nitrogen excretion, and in type C the abnormal mental state is associated with nitrogen retention despite increased general metabolism with a slight fall in body-weight. The fæcal nitrogen remains fairly constant, so that there is no faulty absorption. If a constant diet is given the attacks can be made regular. The interval between attacks can be diminished by increasing the protein intake, and vice versa; thyroxine flattens out the phasic nitrogen swings and there are no periodic mental upsets. The attacks can also be prevented by a low protein diet after depletion of the body's nitrogen store. On these points Gjessing constructed a working hypothesis: he suggested that at a time of change of phase in the nitrogen balance a toxic substance, connected with disturbance of protein metabolism, is produced and acts in an inhibitive or instant way on the central nervous system, producing stupor or excitement at the higher levels and autonomic effects like a sympatheticotonia at the lower levels. Thus these patients are only functionally normal when the body's protein store is at a low level.

Gjessing's points, said Dr. Stokes, have been tested at West Park Hospital on two cases: one a typical periodic catatonia-stupor; the other a patient with symptoms resembling but not strictly conforming with periodic catatonia, who served as a control. Observations were carefully recorded with the aid of specially trained nurses. Focal sepsis was eliminated, and all drugs prohibited, except three cigarettes a day. A uniform fluid diet was given in precise quantities, the calorie allowance being constant throughout. Vitamins were given in tablet form. The fæces were marked weekly by charcoal biscuit and Kjeldahl nitrogen estimations carried out on all food, urine and stools in duplicate. Rectal temperatures and two-minute pulse records were taken before meals and the stripped weight twice a week. The mental state was charted daily. The nitrogen figures were corrected for loss in sweat, hair and semen, for incomplete drainage from feeding and collecting vessels, and for the vitamin tablets. Four experimental periods were devised: in the first the diet consisted of fresh milk and eggs; in the second Antuitrin G was added; in the third the diet was a high-protein one based on dried milk; and in the fourth it was a low-protein one, also based on dried milk. The nitrogen balance reflected the fluctuation of the body's total nitrogen store, the size of which was unknown. During the first period the case of periodic catatonia showed a definite regular phasic swing in the nitrogen-balance

curve, with peaks almost constantly every 40 days; the body-weight rose steadily and there was no appreciable loss of weight during the negative nitrogen phases. Temperature and pulse-rate rose with the negative balance, during which the stupors mainly appeared, but two stupors ended and a third began in a time of positive balance. The control case showed a consistent negative balance with a steady fall in weight, unaffected by a phase of great excitement. The temperature remained low, as did the pulse-rate, although it was uneven. This experiment therefore tended to confirm Gjessing's hypothesis that a swing in the nitrogen balance is primary. Antuitrin G was given to case 1 in a period of nitrogen excretion and a considerable protein anabolic effect was obtained over a hundred days, the idea being to reverse the effect obtained by Gjessing with thyroxine. The protein anabolism, however, occurred in both cases, after a considerable time-lag, and was perhaps due rather to the change in diet produced by summer milk, though that would not explain the periods of nitrogen retention in the control case. At any rate, the results failed to confirm Gjessing's hypothesis that increasing the protein shortened the quiescent interval and vice versa. The high protein diet caused a high positive balance in case 1. The stupor and pulse and temperature changes were divorced from nitrogen excretion. The ability of the body to store protein was good and when its rate was rapid the stupors continued regularly. This again conflicted with Gjessing's hypothesis. Return to the ordinary ward dietary had no effect on the stupors at all, although the weight dropped two stone. Intervention in protein feeding, therefore, did not affect the mental disorder in this case. The association of mental disturbance with negative nitrogen balance, Dr. Stokes concludes, needs explanation; it does not seem to be directly causative.

Dr. S. W. HARDWICK said that no specific disorder in the endocrine glands has been found in schizophrenia though there have been indications suggesting thyroid hypofunction. The empirical administration of thyroid has yielded favourable results, and the substance is usually well tolerated. Partial thyroidectomy has had success. Gjessing studied a small group in which the thyroid deficiency might be specific. In their "normal" phase the picture suggests hypothyroidism while during an attack it resembles hyperthyroidism, with raised basal metabolic rate, whether the disturbance is excitement or stupor. The electrocardiogram resembles that of myxœdema: a flat T1 wave in the normal phase of a type-A case and in the abnormal phase of a type-C case. The impedance angle, however, makes the relationship doubtful. Gjessing used thyroid to counteract a toxic substance produced during nitrogen storage and combined thyroxine with a low-protein diet. At West Park some female patients have been given thyroid extract with a low-protein diet, and clinical observations have been made. The first patient began stuporose, became excited while being given "step-ladder" thyroid doses and then relapsed on the cessation of thyroid treatment. Two other patients became "normal" from stupor. Their weight increased at the same time. Thyroid seems to fail after a relapse. In some cases thyroid seems to be of no benefit. The cases represented a highly selected group, to conform with Gjessing's types. The failure of thyroid treatment may be due to low tolerance, faulty timing, or to the fact that Gjessing's hypothesis is an over-simplification. Further work is needed. The indications for thyroid therapy are a definite rhythmic periodic catatonia, with corresponding variations in pulse, temperature and blood-pressure, and with a good tolerance to thyroid. Relapses to Cardiazol treatment may sometimes be averted by giving thyroid.

The PRESIDENT wondered if the observations could be made even more objective. The periodicity in these cases is very remarkable and is not wholly explained by Gjessing's interesting toxin theory.

Dr. JOHN BRANDER thought that the most important problem is whence the periodicity? Manic-depressive phases may have a schizoid quality and justify a diagnosis of recurrent schizophrenia. The essential thing to find is the cause of the underlying physical phases. Is there a periodicity of nitrogen metabolism in normal people? And are our moods a result of it?

Dr. T. RUSSELL FRASER said that periodicity and response to thyroid are the outstanding features of the type of case under discussion. In Addison's disease the attacks of acute adrenal failure can be influenced by thyroid. The gain in weight is, however, in contrast with the usual results of thyroid treatment.

Dr. STOKES, in reply, mentioned that Gjessing had the assistance of a seismologist, who devised an instrument for precisely measuring the movements of a bed, thus making the observations of the patient highly objective.

Reviews of Books

Lectures on War Neuroses

By T. A. Ross, M.D. Edin., F.R.C.P. London: Edward Arnold and Co. Pp. 116. 6s.

IT is fortunate that Dr. Ross was able to complete this admirable little book before his sudden death in March of this year. It contains the substance of four lectures delivered to postgraduates during 1940. His aim was to help battalion M.O.'s and general practitioners to deal with patients suffering from the effects of shock or strain in war-time. The ideas are therefore expressed simply. "Too much has been written," he says in the preface, "to frighten the general practitioner off these patients, many of whom can be cured or greatly relieved by the ordinary doctor." Dr. Ross's technique is in the main the so-called method of persuasion, based on the writings of Dejerine and Dubois—a method, according to Diethelm, used almost exclusively by those general practitioners in America who try to treat the neuroses. In his preliminary chapter Ross describes normal and pathological fear-reactions and their mechanisms. He believes that poor material could be excluded from the fighting forces if medical boards were allowed access to panel records. In doubtful cases a psychiatrist should be consulted. A battalion M.O. has a chance to help in maintaining morale and to prevent breakdowns, as evidence given to the shell-shock commission after the last war showed. When acute neuroses develop in soldiers, Ross shows that their spread from person to person by suggestion can be prevented. Treatment of such cases consists at first in complete rest with or without continuous sleep; hysterical conversion symptoms are removed with ease, thanks to the highly suggestible state of these patients. He has also outlined the principles of treatment of the more chronic types of neurosis, but points out that some of these are likely to require expert supervision. The book, written in Dr. Ross's characteristically easy and lively style, contains much of value to doctors, whether civilian or in the forces.

The Medical Aspects of Boxing

By E. JOKL, M.D., head of department of physical education, Witwatersrand Technical College, Johannesburg. Pretoria: J. L. Van Schaik. Pp. 251.

Dr. Jokl remarks that though, during the last few decades, physical training and sport have become important educational and recreational activities, "the medical profession has scarcely begun the study of the many 'specific' clinical problems which have arisen with this development." He describes the medical aspects of boxing, a very topical subject indeed both because of the wide interest it excites and its tendency to produce head injuries. He draws from his own experience, from the medical literature, and from fiction and newspapers. Unfortunately, his presentation of material is neither critical nor systematic. The reader learns innumerable more or less interesting facts, but he will often find it difficult to see which the author regards as important and well established. Several pages are given to one case of paralysis of the anterior serratus muscle, and the traumatic genesis of brain tumours has a chapter of its own; injuries to the eye, on the other hand, are not mentioned, and fundamental problems such as the physiology of concussion, disturbances of consciousness, and even "punchdrunkenness" are not exhaustively dealt with. The critical reader will not find it easy to form an opinion about the facts presented nor will he easily learn from the conclusion—which abounds in new quotations—what the author's attitude really is. There is only a footnote to guide him: there Dr. Jokl suggests the immediate exclusion of boxing from the physical-training programme of the armed forces. The book contains a good bibliography which will be useful to any body who wants to study the subject systematically.

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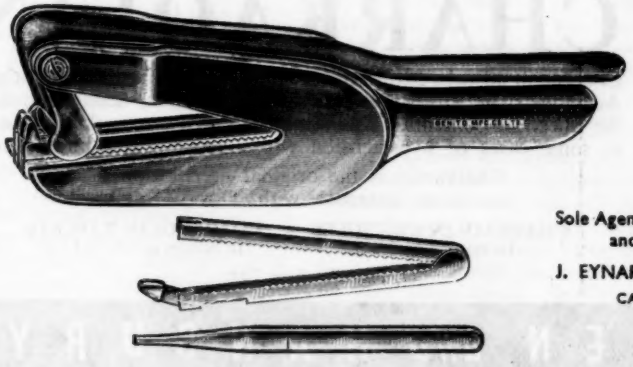

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THE LANCET

LONDON: SATURDAY, JUNE 14, 1941

WAR AND INFECTIOUS DISEASE

HISTORY has justified David's choice of three days' pestilence rather than three months' defeat in battle as punishment for his pioneer work in vital statistics. Had he chosen three months' war he would have had more than three days' pestilence. Even in 1914–18, when more combatants were slain by enemy action than by disease, those camp-followers of armies, typhus and dysentery, did fearful execution upon the civilian populations of eastern Europe and continued to do so long after fighting ceased. It may be doubted whether the volume of human misery in Europe has yet approached the full tide of 1916–20. Miss CLARA E. COUNCELL of the United States Public Health Service, in an account [1] of war and infectious disease from ancient times has summarised the scanty data of the present war. In Europe, both enemy and enemy-occupied countries record large increases of cerebrospinal fever. Germany had 1826 notifications in 1938 and 5046 in 1939. Hungary had an average of 52 from 1921 to 1928 and 395 in 1939. Yugoslavia had 731 cases in 1939 compared with an annual 85–155 in the previous twelve years. Bulgaria had fewer than 50 annually from 1934 to 1936 and 669 in 1939. Typhus is said to be increasing but no precise data are available. It is said that an outbreak of dysentery "comparable to that of the war of 1914–18" occurred in the German Army during the Polish campaign. Notifications of typhoid and paratyphoid showed no striking increase in 1939 except in Finland where they increased from 699 in 1938 to 1048 in 1939. Influenza was widespread in the winter of 1939–40 but not virulent. It is unnecessary to summarise English experience. We may conclude that, as in 1914–18, the regions of weakest sanitation (the eastern and south-eastern European states where ordinary standards of living are low and peace-time sanitary defences incomplete) have been the starting-points of epidemics, while the rest of the embattled area holds firm. How long this will continue must be matter for conjecture. When the standard of living, in terms of food, warmth and cleanliness, has fallen below the level accepted by, say, the Russian peasantry of peace-time, great epidemics are inevitable. But the experience of Germany in the last years of the 1914–18 war and the immediately succeeding years has shown that—given a habit of obedience and a tradition of hygienic order—great lowering of standards of living, military collapse and even civil disturbances do not inevitably breed pestilence. Mortality from tuberculosis did increase greatly, but Germany was never ravaged by typhus or dysentery.

A fundamental difference between this war and the last is, of course, the scale of aerial bombardment. In the belligerent countries many urban populations have been dispersed and this process will presumably continue. In our own experience the intermingling of "salted" and "unsalted" juvenile populations has proved less disastrous than had been expected. It is as obvious on epidemiological as on military grounds that the resident population of industrial cities should be reduced to the minimum necessary to carry on essential duties, especially in those smaller towns where alternative public-utility services are not available. The epidemiological effectiveness of dispersal naturally depends on the provision of adequate accommodation, catering and essential health services in the reception areas. If these are to be satisfactory some measure of permanence must be secured. It is futile to organise accommodation for, say, a thousand families dispersed over many square miles of suburban or semi-rural territory if that accommodation is not used or used capriciously. Miss Councell quotes an estimate that by January, 1940, 87% of our evacuees had returned home; this may be an exaggeration but how great the drift-back was we all know. No doubt mistakes were made by both central and local authorities, but it remains fundamentally true that our national lack of discipline, epidemiologically speaking as well as in some other respects, makes for inefficiency in time of war. Perhaps our national propaganda is at fault; perhaps there is too much tendency to suggest, or half suggest, that if people will but stick it out for a few weeks or months, this or that crisis will be passed. Perhaps it would be wiser to speak plainly not of months but years. The most hopeful way of guarding against epidemics is an orderly dispersal through a prepared territory; tumultuous flights from blitzed towns followed by tumultuous returns are the best preparations for epidemics. No doubt this implies compulsion of a drastic severity, and some will call it a step towards Nazidom. It means, really and not only rhetorically, thinking of industrial cities as in the battle line and essential factory workers as fighting soldiers. In a war of years, the families of these soldiers are necessary to their fighting efficiency and for them the comfort of the unserviceable should be sacrificed. Safety against bombing cannot be secured anywhere, but danger decreases rapidly as one passes from the centre to the periphery of a target area, and much could be done to organise life in the outer suburbs of industrial cities. It might well be that, in the changed world which will arise when barbarism has been quelled, a redistribution effected on military and epidemiological grounds will be the beginning of a new and better social order. Slums may disappear at last and CHRISTOPHER WREN'S dream of a new London may be realised.

1. *Publ. Hlth Rep. Wash.* March 21, 1941, p. 547.

SULPHONAMIDE RASHES

IN the calmer atmosphere now beginning to prevail over the topic of sulphonamide therapy there is opportunity to study side-effects which so far have received scant attention. Cutaneous rashes are often, and conjunctival eruptions sometimes, seen; they are not usually serious but there is still plenty to learn about them. In Great Britain the general experience has been that eruptions are rather commoner with sulphapyridine than with sulphanilamide, though workers in the United States report the converse. Sulphathiazole causes cutaneous reactions more commonly than other sulphonamides. LONG, in America, and MELTON here have noted that it may produce conjunctivitis, and also nodular lesions in the skin resembling erythema nodosum. VOLINI and his colleagues [1] have now undertaken a

1. Volini, I. F., Levitt, R. O. and O'Neil, H. B. *J. Amer. med. Ass.* March 8, 1941, p. 938.

critical survey of 7 sulphathiazole rashes which they have seen and of the cases reported by others. They agree that rashes and conjunctivitis in sulphathiazole therapy are common—in fact probably commoner than nausea and drug fever. Besides mimicking erythema nodosum the rashes may be urticarial, erythematous, morbilliform, maculopapular and purpuric; but the nodular lesion is the most common, probably being the advanced stage of a toxic eruption from long-continued medication. In their experience it has been associated with death from the primary disease in a high percentage of cases. Over here the nodular type of rash does not seem to have this grave significance, even in cases needing the high total dosage which VOLINI and his co-workers consider to be more relevant than the sulphathiazole concentration in the blood. Microscopically, the nodular lesions show hyperkeratosis with an almost complete absence of the keratohyaline layer of epithelial cells. Moderate intra-epithelial œdema is present in the granular layer with elongation of the nuclei perpendicular to the surface of the skin both there and in the stratum germinativum. The papillary layer of the dermis is œdematous and contains a fine fibrillary network; the reticular layer is unchanged. Other sulphonamide rashes are not peculiar to any particular compound. They are often morbilliform in character, but may be scarlatiniform, rubelliform, erysipeloid, urticarial, or even occasionally petechial or purpuric. They may be local or general; though usually mild, severe cases with extensive exfoliation have been reported. A sulphonamide rash is commonly accompanied by fever and general malaise, and the rise in temperature may precede its appearance, though some cases are apyrexial throughout. The blood picture shows no constant changes but there may be eosinophilia. The rash is most commonly seen at the end of about seven days' treatment, but the period is variable and rashes can appear even within a few hours of the beginning of therapy.

No single theory has so far explained the various forms of sulphonamide dermatitis but it seems that drug retention, sensitisation, liberation of toxins and the appearance of photosensitising agents can all play a part in different cases. In some patients there is a relationship between exposure to the sun and the development of skin rashes, and experience shows that sunlight treatment of any kind is contra-indicated during chemotherapy. Sulphonamide rashes arising through photosensitivity are often accompanied by an increased excretion of porphyrins in the urine and fæces, a condition also seen among subjects of acute microbic disease. REMINGTON and HEMMINGS [2] pointed out that the porphyrins associated with sulphanilamide medication, in the human subject and in rats, were coproporphyrin III and coproporphyrin I in the urine and the same two pigments in the fæces; in rats, the proportion of coproporphyrin I was greater. The series III pigments are less active as photosensitisers than their series I analogues, and thus the rarity of severe photosensitisation in patients exhibiting high-grade sulphanilamide porphyrinuria becomes explicable. But the proportion of series-I to series-III pigment formed may vary in different people and this may bear some relation to sulphanilamide idiosyncrasy, particularly dermatitis. The symptoms of acute porphyrinuria to some extent resemble those produced by toxic doses of sulphanilamide. Despite their findings these workers admit the possibility that a form of drug dermatitis may occasionally develop which is not a result of photosensitisation in the usually accepted sense. EIDINOW [3] conducted an investigation on 22 patients who were given various sulphonamides in daily dosages of 3 g. up to a total of 30 g., and submitted to different exposures of ultraviolet light without ill effects. The diseases from which they suffered do not seem to have been comparable to microbic infections, nor was the dosage of the same order, so that it might be unwise to accept outright EIDINOW'S conclusion that sulphonamide medication does not increase photosensitivity.

The differential diagnosis of skin rashes due to sulphonamides is not as a rule difficult but they may be confused with the common exanthemata, especially in children with acute respiratory-tract infections, and it is noteworthy that drug rash and drug pyrexia may be accompanied by adenitis. When the rash is morbilliform, Koplik's spots should be sought; they may be present in measles even after the true rash has appeared. Mild skin eruptions generally fade, even while the drug is still being given, if a detergent is applied locally; but unless the illness is grave enough to make continued chemotherapy essential it is best to withdraw the drug and give plenty of fluids to hasten elimination. Nicotinic acid seems to cause many of these eruptions to subside, and has a specific action in the so-called pellagroid syndrome in which dermatitis begins as photosensitivity and is associated with porphyrinuria and stomatitis. Cutaneous manifestations of sulphonamide intolerance are rarely significant but their possible association with some graver form of toxic reaction—for example, in the hæmopoietic system—makes a blood examination necessary. Once a patient has developed a sulphonamide rash, treatment with sulphonamides in a subsequent illness should be undertaken with caution because he may have become sensitised; in such a case a positive reaction might be obtained with a patch or scratch test, or after a small dose administered by mouth.

2. Rimington, C. and Hemmings, A. W. *Lancet*, 1938, **1**, 770.

3. Eidinow, A. *Brit. J. phys. Med.* 1939, **2**, 150.

RESPONSIBILITY IN A MUNICIPAL HOSPITAL

THE annual report of the London and Counties Medical Protection Society mentions the successful determination of a point of some interest to practitioners on the staff of a municipal hospital. A surgeon and anæsthetist took part in an operation for the removal of a child's tonsils. By an unfortunate accident the patient's cheek was burned and a scar was left. Damages having been claimed against the two practitioners, negotiations began with a view to a possible settlement of the claim. These broke down and a writ was issued. Six months, however, had elapsed between the date of the accident and the date of the writ. If the practitioners were within the Public Authorities Protection Act of 1893, then the action for negligence could not be instituted unless within the statutory six months' time-limit. This question of law was isolated for preliminary decision.

The statute of 1893 was passed to standardise various outstanding enactments which protected

persons in respect of "any act done in pursuance or execution or intended execution of any Act of Parliament or of any public duty or authority or in respect of any alleged neglect or default in the execution of any such Act, duty or authority." Here was a local authority with statutory and public powers and duties in respect of the provision and maintenance of its hospital. If the defendant practitioners, being members of the hospital staff, were executing the public duty or authority conferred upon the municipal council by law, the action would not lie unless begun within six months of the accident. If on the other hand the practitioners were acting as "independent contractors" and not as officers of a public body, they would not have the protection of the statute. The distinction can be illustrated by two cases in the text-books. In Greenwell *v.* Howell (1900) officials of a county council, under instructions from their council, drove along a disputed right of way in order to enable the question of the public right to be raised. They were held to be within the protection of the Act. In Salisbury *v.* Gould (1904) a doctor in private practice gave the statutory notification to the local medical officer of health that a patient was suffering from smallpox. He was held not to be performing a public duty. It has long been recognised as law that servants or agents carrying out a public duty on behalf of a public body have the same right to protection as the public body itself, but the particular circumstances of members of the staff of a municipal hospital do not seem to have been the subject of specific decision until the recent case under discussion.

The judge held that the operating surgeon and the anæsthetist were exercising the public authority conferred on the municipal council and were entitled to the same protection as the council. He dismissed the patient's claim with costs. This satisfactory result is a typical instance of the good service which a defence society, well advised and alert to raise a point of principle where the facts justify it, can render not only to its members but also to the profession as a whole.

Annotations

PUNCH WITH CARE

In a book reviewed on another page Dr. Jokl urges that boxing is so dangerous that it should immediately be eliminated from the training programme of the armed forces. None of the cases of abdominal injury in his collection was in fact due to boxing. Of the two cases of injury to the heart the serious one occurred in a man who took part in a fight in spite of a temperature of 101° F. He quotes a writer who says kidney punches are often followed by hæmaturia, but he does not mention any personal observations. A few cases of peripheral-nerve lesion and of facial weakness of more or less permanent nature are the only injuries to the peripheral nervous system found. One case of hæmoptysis, one of pulmonary tuberculosis "precipitated" by boxing and a few minor bony lesions exhaust the author's list of "peripheral" injuries. More serious is the list of 36 cases who died of intracranial hæmorrhage during or as an immediate consequence of fights. Considering that this report covers the whole world literature, and that fatal cases hardly ever escape public attention, this number is probably not large, as sport accidents go, particularly when compared with fatal accidents in motor cycling or racing. There is, however, that specific problem of boxing, "punchdrunkenness"—the permanent damage due to repeated cerebral injury. This problem is more complicated than one would think from reading Jokl's book. There is no evidence to show, and some reason for disbelieving, that punchdrunkenness can be produced by one or two knockout blows. It is much more likely that continuous hammering, too frequent fights, fighting against heavier or otherwise superior opponents and continued fighting in a "groggy" state are responsible for traumatic encephalopathy. There is also evidence that a considerable proportion of punchdrunk boxers are defectives to begin with.[1] The incidence of punchdrunkenness varies with the social status of the boxer; amateurs are rarely affected, good professionals only after a long career if at all; cheap professionals and paid sparring partners are most liable.[2] The social and economic pressure on these poor "chopping blocks" which makes them go on fighting in spite of all warnings is the main cause of punchdrunkenness. Occasionally amateurs, driven by ambition or vanity, fail to stop while there is still time; Jokl may know of such cases, though he does not quote any. But he will also know of students who sensibly change to another form of exercise before the headache after the first blow is over.

Some like or dislike pugilism for moral and æsthetic reasons; these are not a medical concern. But all who have medical charge of a body of young men in the Forces or elsewhere should know the special dangers of the sport. More than initial or periodic percussion of the chest is required to judge fitness of a man for boxing; repeated neuropsychiatric examinations must be made to find early warning symptoms, and the medical officer should have authority to stop individual contests as well as to forbid a man to box. This should make it possible to prevent permanent damage, though not, of course, all accidents. The total exclusion of so popular a sport could only be advocated on incontrovertible medical evidence; and such evidence has not yet been put forward. But it might be wise to forbid it to special categories of men, such as air pilots, who need all the mental alertness and neuromuscular coördination they can get.

BY, WITH OR FROM WOMEN

The war services committee of the American Medical Women's Association had barely got into its stride when the armistice was signed, and the years after 1918 gave them a bigger chance than the war itself. Their fine record shows how intelligently they rose to it. Under the name of American Women's Hospitals they have helped to set up and maintain 73 hospitals and over 300 clinics in needy countries all over the world—in Albania, Armenia, China, Turkey, Greece and elsewhere. They have also endowed beds—including one to the memory of Dr. Elizabeth Blackwell at the Royal Free Hospital—and paid the salaries of women physicians to work among refugees of China. Now Britain is at war again and the A.W.H. is once more ready to help. Last July their president, Dr. Esther Lovejoy, offered the Medical Women's Federation a monthly contribution for the relief of civilians in our bombed areas. Since then they have sent over £3000—a monthly average of over 10,000 dollars—and the executive committee of the federation give a good account of their stewardship in their *Quarterly Review*.[3] They have sent help to many districts of London, to Belfast, Birmingham, Bristol, Cardiff, Coventry, Glasgow, Hull, Liverpool, Manchester, Plymouth, Portsmouth, Sheffield, Southampton, and Swansea, and they have clothed evacuated children at Cheltenham. Medical work has had first claim on the fund, but patients who have lost everything when their homes were bombed have been helped. One maternity hospital, for instance, divided its share between its actual medical work and parcels of clothing for the mothers with an

1. Jokl, E. and Guttmann, E. *Münch. med. Wschr.* 1933, **80**, 560.
2. Winterstein, C. E. *Lancet*, 1937, **2**, 719.
3. April, 1941, p. 38.

occasional gift of a cot or pram as a special "help-you-on-your-way" present from the U.S.A. Blankets were bought for a large hospital in the provinces which was reopening after receiving several direct hits. A medical mobile unit staffed by a medical woman and trained nurses which works in East London has received a grant. The personal belongings and medical equipment of district nurses who have been bombed out have been replaced. In a hard-hit area medical women have been able to send away some of their patients for a short convalescence as the guests of the A.W.H. Crippled children from an orphanage and the blinded have also been cared for. American medical women are giving us practical help when we need it, and we know we can also rely on their sympathy and coöperation in the tasks of reconstruction that lie ahead.

TREATMENT OF TETANUS

Vener and Bower report[1] a fatality of only 29% in a series of 100 cases of tetanus. Excluding 12 patients who died within 24 hours of admission to hospital the net fatality of the remainder was only 19%. These patients were all treated according to a set plan. As soon after admission as possible a test for serum sensitivity was done and sedatives—chloral hydrate, gr. 10–30, by mouth, or the same amount with an equal dose of calcium bromide per rectum—were given. If necessary these doses were repeated and occasionally phenobarbital, gr. 3–5, was injected intravenously in addition; but deep narcosis was avoided. No further treatment was given for an hour, when the lesion was infiltrated with procaine hydrochloride and 20,000 units of tetanus antitoxin was injected round it; a further 60,000 units was injected intramuscularly, girdling the affected limb with a view of preventing the progress of toxin along nerve trunks. An hour later the wound was excised thoroughly, or incised widely, the excision being kept within the area encircled by the antitoxin. In some cases if a finger or toe was involved it was amputated. Hot compresses of potassium permanganate were then applied to the wound. Five hours after admission 20,000 units of antitoxin was injected cisternally by gravity. After this the temperature often rose, sometimes to 106° F. but usually subsided again in about ten hours; when it had fallen to 102° F. 40,000 units was given intravenously by gravity in 300–500 c.cm. of normal saline, precautions against serum sensitivity being observed during this injection. Two hours after the intravenous serum gr. 15 of hexamine was given intravenously. Vener and Bower suggest that this drug may produce an effect by increasing the permeability of the choroid plexus to antitoxin, by its antiseptic action, by altering the colloids of the nerve-cells, or by some direct but unexplained action on tetanus toxin. In most cases, an hour after the injection of hexamine a further 20,000 units of antitoxin was given intravenously in normal saline as before, and twelve hours later a final 40,000 units was given intramuscularly; in some cases the second intravenous dose was not given but the final intramuscular dose was increased to 60,000 units. A second injection of hexamine was given twelve hours after the second intramuscular dose of antitoxin. Subsequently four injections of 1500 units of antitoxin were given at intervals of four or five days to keep the patient desensitised. No patient in this series received more than 230,000 units. The features of this regime which may have led to the striking reduction in the fatality are the infiltration of the wound with antitoxin and the surgical technique employed, the intracisternal antitoxin, and the use of hexamine. It is a pity that Vener and Bower do not give more clinical details of their cases, particularly in regard to length of the incubation period, the time after onset, and the duration of the reflex spasms; and it would have been as well to state whether any of the cases had previously received prophylactic antitoxin and whether the dosage is expressed in American or international units. Tetanus is such a variable disease that the value of any new method of treatment cannot be assessed without full data.

1. Vener, H. I. and Bower, A. G. *J. Amer. med. Ass.* April 12, 1941, p. 1627.

CANADIAN BLOOD-SERUM

EXPERIENCE in the present war[1] has proved the value of blood derivatives, serum and plasma, in the treatment of traumatic shock. Since no satisfactory evidence is available which demonstrates any difference in the efficiency of serum, whether dried or fluid, and plasma it is probable that in the future their supply will be dictated by practical considerations. Plasma has one great advantage: it can be prepared from stored blood that is too old for longer storage. In areas therefore where it is essential to maintain adequate blood banks, plasma will be the blood derivative of choice for at least a large part of the reserve stock. On the other hand, plasma has proved on the whole less easy to handle in bulk than fluid serum. Fluid serum does not clot and is not easily infected; plasma clots both on filtration, unless great care is taken, and on prolonged storage; it is also not so easy to keep sterile. When donors are bled to make derivatives and not for purposes of blood storage, it is likely then that fluid serum will be prepared rather than plasma. Dried serum is the ideal form in which to transport transfusion fluid; it can be kept at any temperature and is stored in small space. Its preparation is a complex matter and, when transport and storage present no difficulties as in this country, it is clearly more economical to use the fluid form. Earlier reports from the U.S.A., suggesting that serum gives rise to unpleasant reactions which are not found with plasma, have not been substantiated here by experience gained since the outbreak of war. In this country all serum, whether fluid or in process of drying, is passed through Seitz filters, which is not the practice in the States. This precaution may account for the difference in results. The Canadian Government has been distributing blood-serum for some time to Canadian forces in this country. They have now generously offered to extend this service to air-raid casualties here. The serum is prepared from the blood of voluntary donors at Toronto University in a laboratory equipped and financed by the government. The practical considerations we have set out make it clear why serum has been chosen rather than plasma and 500 bottles, each containing enough serum for one administration, are to be sent to the National Institute for Medical Research in London. This increase in supplies will be welcomed by the transfusion service, on which ever-growing demands are being made.

1. Cf. Vaughan, J. and Brown, H. *Proc. R. Soc. Med.* 1941, **34**, 266; Whitby, L. E. H. *Ibid*, p. 258.

NEGLECTED OPPORTUNITY

"Considerations of humanity, of national safety and true economy plead for some immediate effort to check rheumatic disease."—A Plan for National Action.[2]

THE quotation is from the outline of a considered scheme put out by the Empire Rheumatism Council in which the high percentage of cure or relief achieved by the Royal National Hospital for Rheumatic Diseases at Bath receives honourable mention, and it is distressing to learn that not only is this hospital experiencing financial difficulties in common with other voluntary hospitals but that throughout the whole of last year it was not being utilised to its full capacity. The hospital, which has recently celebrated its 200th year of service, treats as inpatients cases of rheumatism, gout, and the like, as well as patients requiring physiotherapy. It has 156 beds. Until August, 1939, its normal complement

2. See *Lancet*, April 5, 1941, p. 457.

of beds was fully occupied and there was a long waiting-list. The Ministry of Health then decided that in emergency the hospital would be used by them and expanded to 323 beds, the extra bedding and equipment being supplied. In September, 1939, on the outbreak of war, all rheumatic patients except 39 were sent home and 41 patients were received from other hospitals. These patients gradually left and the hospital remained largely empty. In December, 1939, the hospital was authorised to fill up to its usual complement and was released from liability for expansion under the E.M.S. scheme, subject however to being taken over at a week's notice. But it proved difficult to fill up again. In the first place the regional officer of the Ministry of Health ruled that E.M.S. rheumatic cases requiring treatment for longer than 14 days must be sent or transferred to the Royal Devonshire Hospital at Buxton. Such a ruling deprived rheumatic cases in the south-western area of the adequate treatment available at Bath, for obviously a period of 14 days is quite insufficient to deal with cases of rheumatism. The embargo was not lifted until October, 1940, but this proved of small help since Bath is omitted from the list of centres established by the Ministry of Health for the treatment of arthritis and rheumatism. Consequently many cases that could be transferred to Bath from E.M.S. hospitals in the south, south-west and west for special rheumatic treatment or physiotherapy are required to go further afield. Representations to the regional officer by the hospital authorities have had little effect. (In practice, however, a small number get transferred to Bath from local hospitals because a particular doctor is aware that his patient will be admitted, and retained.) There must be numbers of cases with war injuries requiring inpatient treatment with physiotherapy, and more use could be made of the hospital in this direction. In the second place the unawareness of the facilities available may largely account for the falling off in civilian cases. With the present shifting conditions of medical practice, doctors who previously sent their cases to the hospital are now elsewhere and those who have taken their place may not be aware of the facilities. Whatever the explanation the fact is that during the first four months of 1941 the average of occupied beds was only 111, and there is no shadow of doubt that the empty beds imply suffering and disability left unrelieved.

SILAGE

A YEAR ago we were looking forward to a great increase in silage-making, provided rain fell at the appropriate time. The hope—hardly ever unreasonable in England—was disappointed. But though dry weather in the autumn limited the amount of surplus grass, enough was available in some districts to give practice and confidence in the use of the silo. Failures have been few, and some were due to attempts to ensile the wrong sort of material; they have served to correct the impression that ensiling can turn rubbish into sound stock food. Silage is of two different types, depending on the material from which it is made. Protein-rich silage, made from young leafy grass by the addition of molasses, can replace imported cattle-cake, and is thus specially valuable just now. Other types of silage, made from arable-land crops or from grass cut at a later stage of growth, can only be substitutes for hay. They should not be despised, however; weather permitting, it is better to make hay of this older herbage, but if the weather is bad the grass can be saved by ensilage. Protein-rich silage and hay are not competitive but complementary; they are made at different seasons and stages of growth of the grass, and for winter feeding protein in the silage is necessary to balance carbohydrates in the hay. Those who were dubious about making protein-rich silage have been convinced of its feeding value during the winter. Stock took to it readily and soon showed a preference for it. Cows developed "bloom" on their coats and colour in their milk which are normally found only in animals on summer grass. We drew attention [1] to the importance of making this high quality silage last July, and the need is now greater than it was then. The Government aims to produce as much food as possible for direct human consumption, and stock—other than dairy cows—must be considerably reduced. Even the dairy farmer has to contribute his share of land to the ploughing-up campaign. This means that he will have to make the best possible use of his decreased acreage of grass. The growth of grass is fundamentally affected by the weather, particularly by rainfall, but much can be done by skilful manuring and management to make two blades of grass grow where only one grew before. Provided there is sufficient other nutriment in the soil, nitrogenous fertilisers will hasten the growth and increase the grass yield with little or no detriment to the pasture. Fortunately, good supplies of such fertilisers are available. Many farmers have planned ahead what sizes of silos will best suit their needs, and have decided which fields are to be cut for hay and which for silage. Others are waiting to cut odd corners and bits of surplus grass left by grazing stock. Others are hoping for ample rain after their hay is cut and stacked, so that the aftermath may be ensiled to give protein-rich material.

Portable silos are available and skilled advisers in every district are anxious to help with any difficulties that may arise; but the chief difficulty may be with the rain supply, for if that is uncoöperative again there will be no surplus grass.

WOMEN WORKERS AND BROKEN TIME

WOMEN in industry consistently show a higher sick-rate than men. Dr. Margaret Dobbie-Bateman, who drew attention to this fact at a meeting of the Association of Industrial Medical Officers on May 17, added that the gynæcological sick-rate was not high, and that no special consideration was needed by women at the menses. This has not been universal experience. Miller has calculated [2] that in Canada 9000 working days are lost yearly by women owing to menstrual troubles. Other speakers at the meeting agreed that dysmenorrhœa was a common source of short-period broken time. Possibly varying popular standards account for difference in experience among factory medical officers. There is a widespread belief among elderly and middle-aged women that dysmenorrhœa is natural and inevitable; a belief which finds no counterpart among younger women who have been accustomed to play games during menstruation and to expect no discomfort from a natural function. The greatest time loss in industry from dysmenorrhœa is found among sedentary workers, and physical exercises, performed regularly, help to prevent it. Dr. Sybil Horner noted that a rest-room under the care of a simple-minded untrained attendant appears to be an invitation to enjoy dysmenorrhœa for some hours with a cup of tea, at even fortnightly intervals. She suggested that rest-rooms should rather be called "recovery rooms" and that the time for which workers should be allowed to use them should be limited. Dr. R. E. Lane had prevented abuse of his rest-room by insisting that workers using it should clock out at the end of an hour, if they were not fit for work by that time. A less arbitrary line can be drawn when the rest-room is under the care of a doctor or nurse who can assess the patient's condition. Pregnancy is not regarded as a bar to employment though Dr. Alice Swanston advised against taking on pregnant women as beginners. She noted a striking difference between the young muscular women who can do a man's job and keep it up all day and elderly matrons with flabby abdominal muscles and a tendency to palpitations.

1. *Lancet*, 1940, **2**, 74.
2. Miller, N. F. *Canad. med. Ass. J.* 1940, **42**, 349; and see *Lancet*, 1940, **2**, 492.

These older women cannot stand as well as men and long hours predispose them to flat-feet, varicose veins and menorrhagia. Shoes were criticised; factory workers, like nurses, are not always sensible in their choice it seems. There appears to be a good case for providing a special type of protective shoe for women in industry and this might well eliminate the greater part of minor ailments of the feet as well as others due to faulty posture and fatigue.

Hours of work for women are now being stabilised at two ten-hour shifts for 5½ days a week or three eight-hour shifts for 6 days. Last summer women were working an 84-hour week; Miss F. I. Taylor, deputy chief inspector of factories said (as she must so often have had to say) that long hours were a cause of absenteeism. Women who are trying to run a home as well as respond to the demands of industry cannot work a seven-day week; the needs of their family make it impossible. Absenteeism may amount to as much as a third of the strength on Saturday mornings and many women take a day or a night off regularly each week to put their houses in order and do the week-end shopping. Communal restaurants are needed, and needed badly, if this large body of workers is to go on serving the national need.

IMPENDING DRUG LEGISLATION

THE bill to repeal the medicine stamp duties and at the same time to "maintain a fair balance between the interests of pharmacists and of other vendors" will aim at a limited measure of control over the sale of proprietary medicines; and also at removing from the Pharmacy and Poisons Act, 1933, the "flaw" by which the sale of drugs was unintentionally disallowed in the grocery departments of coöperative societies.[1] Thus the prospects are that Mr. Ernest Brown will introduce a sort of omnibus bill: to correct errata in legislation enacted as far back as the eighteenth century and as recently as eight years ago; and to restrain the owners of proprietaries from doing something which none of the reputable ones are in the habit of doing—that is, from claiming that their specifics will cure diseases which are believed to be incurable by drugs alone. It is now possible to define more precisely the terms of agreement which have been reached between the makers of proprietary articles and the distributors of them; and so to foreshadow provisions in the bill designed to compensate pharmacists for the loss of a privilege long enjoyed by them. It seems that the interested parties have agreed that all shopkeepers should be at liberty to sell such medicines, but that non-proprietary medicines, whether simple or compounded, shall be sold only by pharmacists if the labels on the packages name the complaints for which the drugs are intended. If this became law, a grocer could sell Glauber's salts, or a mixture of rhubarb and soda, provided no indication was given to the purchaser about their medicinal properties; but it would be an offence for the grocer to sell Glauber's salts labelled "aperient" or rhubarb and soda labelled "for stomach ache." Apparently the grocers and other non-pharmaceutical retailers are not averse from the loss of rights implied by this arrangement; probably they expect to make up on the proprietary roundabouts what they will lose on the household-medicine swings. The pharmacists, who as a body perhaps prefer to handle goods of known composition, appear to be satisfied with the compromise, and the manufacturers of proprietary medicines have no cause for discontent since the channels through which they will be able to distribute their products will be unlimited. Yet it seems anomalous that a grocer should be allowed to sell recommended remedies of unknown composition and become liable to penalties by selling recommended remedies of declared composition. The task of the Minister of Health in sponsoring this "non-controversial" bill is not an enviable one.

Clauses for the control of proprietary medicines will make it illegal to advertise medicines for the relief or cure of conditions such as blindness, cancer, consumption, Bright's disease, epilepsy, locomotor ataxy, lupus and paralysis; or to recommend drugs to procure the miscarriage of women or to promote sexual virility in man. Thus reputable proprietary medicine owners stand to lose nothing.

It is too much to ask, at present, that the whole question of the sale of medicines should be overhauled by Parliament, but it might be wise to limit the duration of new legislation, hurriedly enacted, to a date not far exceeding the conclusion of peace. This is no time, as we have said before, for helping the sale of secret remedies.

1. See *Lancet*, April 19, p. 513 and Jan. 25, p. 130.

ON a later page will be found the conclusion of a report of the summer session of the General Medical Council held at the Royal Institute of British Architects. We are glad to learn that the architect who has made a preliminary survey of the council's house at 44, Hallam Street, damaged by enemy action, regards the structure as still sound. If the necessary permissions and priority certificates can be obtained the council may be able to hold the November session under their own roof again.

Dr. ISAAC FROST has been appointed medical secretary to the British Social Hygiene Council in succession to Sir Drummond Shiels, who will however continue to act as medical adviser to the council. Dr. Frost qualified from Bart's in 1921 and took his B.Sc. Lond. with first-class honours in physiology in 1926. He also holds the D.P.M. He has taught biochemistry in Madras, physiology in Birmingham, and has lately served in the L.C.C. mental hospitals department. He has made a special study of homesickness and immigrant psychoses and of epilepsy.

Sir JAMES REID ROBERTS, C.I.E., who has died at Srinagar at the age of eighty, was a distinguished member of the Indian Medical Service in its palmiest days. He spent the whole of his service, after the completion of the necessary short period of military duty, in the political department, and rose steadily to reach the position of administrative medical officer for Central India. Holding the highest surgical qualifications he did much to raise hospital standards in the central states. During his time in India he was a welcome and genial member of medical congresses and before his retirement in 1919 he saw service with the army in Mesopotamia. He will be missed by his many friends and admirers.

E.M.S. FRACTURE DEPARTMENTS.—The Minister of Health has lately reviewed the facilities available for the treatment of fractures in E.M.S. hospitals. He is anxious that all fractures cases should receive the treatment best suited to their needs under the care of experienced surgeons in well-equipped hospitals and he has set out the adaptations he proposes to make in the existing arrangements in circular 2395. The special orthopædic centres which have already been set up will not be altered in any way but in addition three new classes of centres for the treatment of fractures will be established. The first group will be those suitable from their situation for receiving cases requiring treatment for a considerable time. The second group will be fracture departments suitable for the treatment of ambulant patients and those who do not require more than about a week's inpatient treatment. The third group will be fracture clinics providing outpatient treatment by massage and remedial exercises for patients who have been discharged from hospital. Where orthopædic centres and fracture departments are not available within reach of the patient's homes these special clinics will be needed. Lists of the existing orthopædic centres and the two new groups of fracture departments are attached to the circular.

Special Articles

THE FUTURE OF GENERAL PRACTICE

By Dr. Harry Roberts

Our medical services, like nearly everything else, have been dislocated by the immediate urgencies of the war. All clouds are said to have silver linings; destruction affords opportunity for reconstruction. How, in the light of past experience, can we, after the war, best rearrange our disordered medical services? This question is being asked and tentatively answered in almost every issue of our medical journals, as well as in the lay press and elsewhere. I wish to confine myself to consideration of the position of the general practitioner—the only sort of doctor with whose work I am personally familiar. I am not going to prophesy, to foretell what will happen; but rather to say what, in my opinion, is the future at which we should aim and for which we should hope.

That general practice after the war will not be like pre-war practice is certain. Few of us would wish otherwise. But there is no virtue in mere change; the fire is a poor exchange for the frying-pan. Nor can any simple formula solve the matter. Many doctors and many members of the public seem to think that all will be put right if we substitute for our present system, a system of state doctoring. It is almost certain, and in my opinion to be hoped, that the state will play a much bigger and more general part in the provision and organisation of the medical services than it has done in the past, especially on the financial side. But whether this is to represent an advance or a regression depends entirely on the sort of state doctoring we get. In any case, we shall be wise to cut out all the stereotyped clichés and blessed words, Capitalism, Socialism, Mesopotamia and all the rest of the mares' nests and red herrings that clutter up the road of medico-political reform.

The basic problem of a truly democratic state in this matter of doctoring is to secure for every man, woman and child in the country, in proportion to their several needs and without regard to individual ability to pay for them, the benefits of all the medical skill and knowledge available. Coupled with this problem is that of progressively increasing, by the provision of educational and other facilities, the amount of medical skill and knowledge available.

THOSE WHO MUST OPERATE THE SCHEME

Enthusiastic but uninformed social reformers are very apt, in their zeal for mechanical tidiness, to take little account of the material they propose to reshape. In the carrying out of any work of value, nearly always the most important factors to be taken into account are the technical abilities and goodwill of the men and women entrusted with it. The human reality, to quote Barbusse, is the individual: "Every collective organisation of men must come back to the individual man, be quickened by the individual life, and respect individual autonomy to the fullest possible extent."

It is important to remember that, whatever formal arrangements may be made, whatever may be the basis on which medical services are organised, the community is, at any given time, dependent on the current ability and goodwill of the medical profession. No matter how well a health scheme may look on paper, or how potentially excellent are its results, those results will not materialise unless there is a general and individual will among the doctors that it should and shall succeed. As Lagardelle said many years ago: "The transformation of the world does not depend on a simple change of government." To some extent this principle holds good of every trade, craft and profession, but in the case of the medical profession it is all-important; for medical services cannot be measured as bread is measured, either quantitatively or qualitatively. A scheme that is forced down the throats of the people who have to carry it out against their wishes and against their judgment rarely succeeds.

On the face of it, the problem of effectively organising and distributing in the common interest the medical skill and medical knowledge available does not seem a very difficult one. The practice of medicine, however, is not merely mechanical; it is an art, and consequently depends for its success on the active coöperation of the artist. Some branches of the healing art have so precise, so scientifically based, a technique that competence and incompetence are easily gauged and the emotional factor need not worry the organising statesman. Skilful surgeons, for example, however organised and however paid, are likely in all circumstances—if they operate at all—to operate as well as they can. So with many of the diagnostic and therapeutic techniques which occupy so large a place in modern hospital practice. But it is different with the everyday professional intercourse between doctor and patient. The intimacies of the consulting-room are not quite like anything else in the world. The reciprocity of the relationship is in contrast with the impersonality of the confessional.

There are two fundamental questions which call for answer: Who is to pay the doctor? Is the doctor's prime duty to his patient or to his employer? Throughout medical history, his duty to his patient has been reckoned as absolute. That is why, hitherto, those who could afford to employ a doctor of their own have preferred to do so rather than accept the ministration of a salaried official of the state.

In private practice, the fees charged to the patient have customarily been more or less adapted to his economic status; but all too often the service rendered has been in proportion to the fee charged. If we are to establish our claim to the title of democrats we should receive exactly the same fee in respect of our treatment of rich and poor; and that means that we must be paid by the state, which has the power and the right for communal ends to take money from individuals in proportion to their surplus wealth. In plain words, I believe that the only wise and fair method of paying general practitioners for their services is by capitation fee, uniform throughout the population. Every man should be free to choose a doctor practising within his area and willing to accept him as a patient; and, if dissatisfied with him, to transfer his allegiance to another doctor at the end of any quarter. Make everybody a panel patient, eh? Yes, make everybody a panel patient. I would have it an offence for any panel doctor to accept a private fee for medical work of any kind, but it should be open for any non-panel doctor to practise as a free lance—specialist or otherwise.

At the moment, it is absurd to talk about money in terms of figures. None of us has the least notion of what a pound really means; still less have we a notion of what it will mean when the war ends. I will merely say, therefore, that I think that, with a universal panel service such as I suggest, the capitation fee should, in proportion to other professional fees, be higher than it is at present. I say this the more easily because I shall not be an interested party. By no method other than that I have proposed do I see how we could retain anything like the traditional relation of doctor and patient during the period which is bound to intervene between the transfer from plutocracy and class society to the new democratic society for which so many of our fellows are prepared to sacrifice their lives.

CHAOTIC GROWTH OF THE HEALTH SERVICES

If we agree that a general-practitioner service should be at the disposal of every man, woman and child in the country; and if it is further agreed that (through the general practitioner) hospital and specialist treatment should be made equally available when necessary, how best could this liaison be established? More than twenty years ago, thoroughly sound and practical schemes were provided by the Dawson Committee, and in the report prepared for the Scottish Board of Health by a consultative council of which Sir Donald MacAlister was chairman. There was scarcely a breath of adverse criticism; but not an item of either scheme was acted on. Our medical services—preventive and curative—have grown up anyhow, not as parts of an organic whole but with only casual inter-relation and consequently with great wastage of personnel. The general practitioner or family doctor, the official administrator of preventive medicine, the school doctor and the voluntary or provided hospital have no common currency, no satisfactory instrument of intercommunication, and therefore small coöperative effectiveness.

When most of the discrete services came into existence, medicine had far less to offer than it has today. The competent general practitioner was in a position to apply pretty much all the diagnostic and therapeutic knowledge at the disposal of the healing art. Major surgery and one or two specialties—such as ophthalmology—were outside his province; but for the rest varying individual intelligence and judgment alone distinguished one doctor from another. Things are very different now; with the best will in the world, no single practitioner can cover the whole field of therapeutic technique; nor can the individual doctor provide for his patients the elaborate machinery needed for the adequate investigation of any but trivial ailments. So far as the well-to-do are concerned the difficulty is more or less effectively met by a sort of hierarchic departmentalism, involving a series of expensive references to bacteriologists, radiologists, biochemists and other specialists. This complicated procedure is obviously beyond the purchasing capacity of the poor. Moreover—though it has not been so generally realised—it is beyond the means of the great majority of professional and other middle-class people. The possibility of bringing the resources of modern medicine and surgery within the reach of the poor has been demonstrated by the voluntary hospitals of our great cities; and the new staff-salaried hospitals of the county and borough health authorities are rapidly following in their steps. The hospital habit is growing in all classes, and it is difficult to imagine any really effective alternative method whereby specialist treatment—major surgery, electrotherapeutics, dentistry and the like—and modern diagnostic technique can be brought within the reach of the bulk of those who need them.

THE EDUCATIONAL BACKGROUND OF PRACTICE

Medical science and medical practice are not the same thing. There is a time lag between them so that real progress may take place in the one without any coincident apparent change in the other. Rare indeed is the faculty for applying newly acquired knowledge to the solution of old and familiar problems. Moreover, intangible things figure so largely in the therapy of the successful physician that he is inclined to be almost indifferent to spectacular advances in the physical sciences even when they have obvious relevance to human physiology. It was Samuel Butler who, half a century ago, said, "A physician's physiology has much the same relation to his power of healing as a cleric's divinity has to his power of influencing conduct." A century earlier Colton, another cynical realist, wrote: "No men despise physic so much as physicians, because no men so thoroughly understand how little it can perform."

Is the new doctor no advance on the doctor of the last or of the penultimate generation? Can he and does he do no more for a sick patient? Well, the physiologists and the research scientists have, during the early part of this century and the years immediately preceding it, given us a lot of very handsome presents. They have discovered and brought to our notice many vitally important things of which previously we had not the slightest knowledge: the microscope did not reveal their existence; nor did the test-tubes and chemical balances give any hint of them. Our knowledge of the endocrine glands, of the hormones, of the vitamins, is all new since I was a student; yet already it is impossible to take seriously a therapeutic technique which takes no account of the elaborate chemical control that plays so essential a part in harmonising our cellular and structural activities.

There is, happily, increasing recognition of the part played by general, as distinguished from specific, causes of disease. Germ hunting is not the medical sport of the moment. Enthusiasts are giving far more attention to nutritional and other environmental conditions. The doctor's job tends to make him somewhat contemptuous of generalisations; therefore, few practising physicians are found in the ranks of political extremists. But today realistic evidence—some furnished by laboratory research, some by direct observation of the men, women and children with whom the individual doctor is brought into contact—is driving more and more intelligent members of the profession towards the socio-political left. Almost any week one can find in the pages of the *Lancet* or the *British Medical Journal* statements of fact and sober expressions of opinion far more root-disturbing than anything more tendentiously expressed in the *Daily Worker*.

It is not to curative medicine but to social hygiene and general economic advance that we mainly owe the fall in our national death-rate from 18 per 1000 at the beginning of the century to under 12 per 1000 in 1934, and the fall in our infantile death-rate to little more than a third of the figure at which it stood fifty years ago. It is towards the raising of the general level of health—psychic as well as physical—rather than towards the securing of some slight extension of the length of individual life, that medical and hygienic enthusiasm is now being gradually diverted. Recent physiological discoveries afford much scientific ground on which to build.

The average general practitioner of today is as knowledgable as were his ancestors; but it is as an instructor in the art of personal and domestic hygiene, as a skilled diagnostician, and as a trained all-round emergency man, that he could, in the twentieth century, most helpfully play a part in an organised medical service. That is where a man's doctor ought to be useful; but he has not been trained to help in this way. When he comes from his medical school, the young medico knows no more than the average layman about the art of healthy living. He thinks in terms of suppuration, pneumonia, colitis, neoplasm, septicæmia, physical lesions, ulceration and so on. What we want is a new kind of family doctor, one who knows all about these things I have mentioned, but knows also, and is more fundamentally concerned with, real personal health—the art of being whole, hale, alive. The basic teaching of the medical student should aim at equipping him with such knowledge and with such a scientific attitude of mind as will enable him to recognise the *beginnings* of serious disease; mental as well as bodily. It should make him competent to give adequate treatment to his patients suffering from ailments which do not call for specialist skill. It should make him familiar with personal hygiene and preventive medicine; thus enabling him to be of real service to his patients, both in the preservation and in the recovery of health.

THE REGIONAL PATTERN

Meantime, we can make a good start with the material and personnel we have, if we will but knock the organisation of the health services into shape. The first steps towards the materialisation of a truly national medical service are so obvious and—compared with our present daily national expenditure—so collectively inexpensive, while at the same time so little disturbing to existing personal interests, that there seems no excuse for our not getting ready to take those steps directly the war is over. How are we to set about it? First of all, the country should be divided into regional units—not necessarily coinciding with existing counties or other administrative units—each with a regional council responsible for the provision and coördination of the hospital, specialist and domiciliary medical services within its area. The local authorities within the area, the voluntary and provided hospitals, and the general practitioners should all be represented on this council. These regional councils should, while possessed of considerable local autonomy, be ultimately subordinate to the Ministry of Health. They should be concerned solely with problems of health. The organisations should centre round a large hospital, preferable a teaching hospital of the university type. In all towns with populations of 10,000 or over there should be secondary hospitals staffed by salaried surgeons, physicians and specialists. In the smaller towns there should be adequately but more simply equipped hospitals of the cottage-hospital type, staffed mostly or entirely by the local general practitioners. Between the practitioners and these three grades of hospitals and the specialists connected therewith, there should be full coöperation. Through the family doctor all the auxiliary health services—specialist service of all kinds as well as institutional amenities—should be mediated. It is likely, as it is desirable, that the hospital will come to be, in every area, the centre of local medical life and local hygienic effort. At present there is a great leakage of energy and skill through the lack of coördination between the hospitals and the outside practitioners

on the one hand, and between both and the preventive health services on the other. The public sanitary services—the medical officers of health and their subordinates—in this country have been, and are, generally satisfactory, but preventive medicine is now recognised as having scope and potentialities beyond those hitherto assigned to it. It is becoming increasingly realised that most, even of the gravest, diseases have relatively minor and often remediable beginnings. No serious steps are at present taken to recognise disease at this stage. A careful periodic examination of each person, well or ill, would, if carried out by doctors adequately trained and equipped for the work, have great preventive value. The greater part of ill health is associated with faulty environment or faulty habits of life. It is therefore foolish extravagance to concentrate on the palliation of evils due to such causes the time, energy and knowledge that might have been devoted to their prevention. The problem needs to be set out in due order—first things first.

MEDICINE AND THE LAW

Concerning Coroners

A PARLIAMENTARY question has revealed some doubt about the departmental control of coroners. It seemed to suggest that, if there were complaint of the coroner for a county district, the power of the Lord Chancellor was ill defined and the power of the Home Office non-existent. In reply the Attorney-General naturally referred to section 8 (1) of the Act of 1887: "The Lord Chancellor may, if he thinks fit, remove any coroner from his office for inability or misbehaviour in the discharge of his duty." The Attorney-General briefly outlined the Lord Chancellor's practice. When the latter formed the opinion that a complaint (if substantiated) would be such as to require the coroner's removal, he would take the case up, giving the coroner a full opportunity to deal with any charge made, and he would decide judicially. Under section 8 (2), of course, wilful neglect of duty is a statutory misdemeanqur and one of the possible penalties is removal.

The official answer seems to leave uncertain the part played by the Home Office. Suppose the complaint were that the coroner was absenting himself from his district and leaving no deputy available to attend to the inquests for which his services may, in present circumstances, be all too often required. It is ancient law that it is "inability" in a coroner to dwell in the extreme parts of the county so that he cannot conveniently exercise the duties of his office. Individuals are entitled to make a complaint to the Lord Chancellor. He may not care to act as investigator of a case whereon he may later have to adjudicate. He would therefore presumably refer it for prima facie examination by the Home Office as the department ordinarily concerned with matters affecting coroners. The recent parliamentary question seems to hint that the Home Office should not thereafter relapse into inactivity but should maintain a reasonably strict standard and should do more than it now does to bring the investigated complaint before the Lord Chancellor. It is possible that the Home Office, preoccupied with security matters, is unable to give full attention to less urgent affairs. The difficulty, if difficulty there be, can doubtless be remedied departmentally. The Attorney-General, at any rate, seems satisfied with the statutory position.

Parliament is unlikely to entertain at the moment any legislative proposals of a controversial nature which have no direct relation to the war effort. Further amendment of the law of coroners is therefore indefinitely postponed and the vexed question of medical versus legal qualifications remains where it was left by the Wright Committee in 1936. The committee, it will be recalled, had a strong legal element in its composition. It recommended that in future only barristers or solicitors should be appointed to be coroners, and that, wherever possible, they should have had experience as deputy coroners and should have knowledge of forensic medicine. The London County Council anticipated the proposed amendment of the law by deciding in 1937 that in future only barristers and solicitors should be eligible for metropolitan coronerships. The recent appointment by the Middlesex county council of a coroner who is a doctor and not a barrister is therefore the more interesting. Mr. Ingleby Oddie, whose book was noticed lately (*Lancet*, May 10, p. 606), provides a rare example of the coroner who has not merely possessed the dual qualification (in medicine and law) but has actually practised both professions. The Wright committee seemed to place almost as low a value upon being thus doubly qualified as upon being qualified in medicine alone. It may be admitted that, when a coroner stands upon the double qualification, one leg will usually be stronger than the other. It is believed to be Mr. Ingleby Oddie's conviction, based on long practical experience, that, if the country wants the best coroners, they should be doctors. Neither profession can make an impartial pronouncement on this issue.

One intriguing suggestion has lately been made or revived. The coroner's functions are closely related to those of the registration of deaths. Modern health administration has given the medical officer of health an overwhelming interest in the information which is, or ought to be, available to the registrars of births and deaths and in the careful exercise of their duties. Would it make for greater social efficiency if he took these duties over?

The Reconciliation of Medical Evidence

Some weeks ago we discussed a claim for personal injuries (*Lancet*, March 29, p. 425) where the trial judge had criticised the calling of a medical witness after a preliminary order had been made for proceeding on agreed medical reports. Overruling him on grounds there mentioned, the Court of Appeal vindicated the value of medical evidence given orally in court and subjected to cross-examination. A solicitor has sent some courteous comments on our discussion of the issues. It was suggested that the plaintiff might feel scant confidence in the course of justice if his own medical witnesses were told to harmonise their testimony with that of the defendant's medical witnesses. Our correspondent less rhetorically observes that such an order would be as vain as to tell the plaintiff to settle with the defendant out of court. It would transgress the principle that not only must justice be done but it must also manifestly appear to be done. He recalls a case from his own experience where, without authority, the doctor of an injured plaintiff "agreed," or purported to agree, a medical report with the defendant's doctor. The plaintiff's solicitor at once instructed a second doctor to examine, report and attend the court. Expert witnesses, it is plain, must be careful how they fraternise across No Man's Land.

Our correspondent adds his frank misgivings about the existing system as seen from the legal side. Litigation arising out of personal injuries has, he thinks, become so much a matter of tactics and technique—in his own vernacular, such a "racket"—that reforms reaching beyond mere rules of procedure are now required. "The highly specialised medical witnesses (the medico-legal experts referred to in Knocker's 'Accidents in their Medico-legal Aspects'), the policies of certain insurance companies, the sharp, sometimes unscrupulous, practices of lawyers and the highly complex state of the law (especially of workmen's compensation) are all in some measure responsible for the existing state of affairs." He does not think that the facilities for bringing in a medical referee to sit with the county-court judge as assessor in workmen's compensation cases (on the application of either employer or workman at a three-guinea fee) has substantially improved the determination of these disputes.

Our account of the case under discussion, by the way, spoke too compendiously of the preliminary order "that the parties should agree the medical reports." As our correspondent points out, the full wording of the order in cases involving personal injuries is "that medical reports be agreed if possible, and, failing agreement, the medical evidence be limited to" a specified number of witnesses on each side. The limitation of the number of expert witnesses is an obvious step towards expediting the business of the courts and neutralising the power of the purse enjoyed by rich litigants. Some 15 years ago the late Lord Tomlin, then a Chancery judge, created a rule of practice which refused to admit more

than two expert witnesses unless there were special reasons to the contrary. His brethren on the Chancery bench adopted the rule, but, as the House of Lords indicated in the British Celanese *v.* Courtaulds litigation, the calling of irrelevant expert evidence can still be an abuse. Medical witnesses are more frequently seen in the King's Bench division and the county courts than on the Chancery side, and there has occasionally been a tendency to invite a jury to decide according to the numerical preponderance of doctors on one side or the other. But jury cases grow fewer and fewer; it is the judge who now usually has to decide the facts as well as the law. Both the High Court and the Court of Appeal have statutory power to call in the aid of "one or more assessors specially qualified"; but neither this nor any other method has yet done much to supersede the prolonged wrangle over disputed facts to which professional witnesses must make their contribution.

UNITED STATES OF AMERICA

CONTAMINATED SULPHATHIAZOLE TABLETS

FOR three months there have been widely distributed a number of tablets of sulphathiazole which in manufacture were accidentally contaminated with phenobarbital. The company responsible has known about the mistake since Dec. 20. However, the U.S. Food and Drug Administration did not learn what was happening until March 20 and then learned not from the company but from the Health Department of Boston. The American Medical Association became aware of the accident through a report received on March 26. Both of these national organisations took prompt measures to discover the three lots of contaminated tablets and to warn physicians against their use, but all tablets have not yet been found. The amount of phenobarbital in each tablet is not constant. A few patients are known to have slept from 36 to 48 hours. One patient, on the other hand, took four tablets, one every 3 hours, and merely felt drowsy.

VOLUNTARY HEALTH INSURANCE

It was on Feb. 5 that the supreme court found the American Medical Association and the Medical Society of the District of Columbia guilty of conspiring to restrain "trade" of the Group Health Association of Washington, D.C.[1] A few days before Group Health Cooperative, Inc., of New York City, held its formal opening. The subscription rate is $24 a year or $18 when a group is admitted. There are about 250 physicians whose services are available under the plan. The medical advisory board under the chairmanship of Dr. Kingsley Roberts reads like a medical Who's Who of New York City and includes the professors of medicine both of Cornell and Columbia medical schools.

AMERICAN EUGENICS SOCIETY

This society held its spring conference and fifteenth annual meeting in New York City on March 31. In the morning the subject for discussion was recent advances in knowledge of human heredity. Dr. E. J. Humphreys, director of research at Letchworth Village, and editor of the *American Journal of Mental Deficiency*, reviewed the literature, and Dr. William Allan, founder of the Family Record Office of Charlotte, North Carolina, stated the arguments for studying human hereditary disease. Since so little is known about the inheritance of disease, the best place to begin such a study is, he thinks, with those diseases that wreck childhood, such as blindness, deafness, crippling and defects of the central nervous system. Women are prepared to accept the discipline of contraception rather than face the risk of giving birth to such defective children. Public-health departments should make themselves responsible for the collection of family records through which the mechanism of heredity can be studied and by which advice can be given to prospective parents.

In the afternoon discussion centred around the need for a population policy. Mr. Frederick Osborn described the task of eugenics as being the reduction in the number of defective persons and an increase in the proportion of people born capable of being leaders. Mr. David V. Glass, research secretary of the Population Investigation Committee of Great Britain, denounced the population policy of Germany and Italy as being "merely part of an imperialist and expansionist policy." In 1927 Mussolini had said "to count for something in the world Italy must have a population of at least sixty millions by 1950." He commended the population policy of Sweden. Mr. Frank Lorimer, professor of population studies at American University, welcomed the cessation of population growth in the United States but regarded with misgiving the trend toward a rapid fall in population. To assure the future of the nation conditions must be created that will lead educated parents in the broad middle classes of America to have families of 4, 5 or 6 children. A world order without war must be built, for war is a double jeopardy—it destroys lives and prevents births. Economic depressions must be controlled by planning since the automatic controls assumed in classical theory no longer guarantee stability. It must be made possible for young parents to start a family without disastrous results to their standards of living.

1. See *Lancet*, May 24, 1941, p. 675.

GENERAL MEDICAL COUNCIL

SUMMER SESSION, MAY 27–28, 1941

(*Concluded from p. 733*)

As a result of reports from the Dental Board the registrar was directed to erase from the Dentists Register the names of James Harold Hill and John Harold Smith, and to restore the name of Albert Stanworth.

Charges against Medical Practitioners

The council then considered a number of charges arising from drunkenness, either in civilian or in Army life. Four of these had origin in general courts martial which had ordered dismissal from the Service. In no case, however, was the name erased from the register.

The council directed the erasure of the name of Horatio Matthews, registered as of 30, Harley Street, London, W.1, M.D. Glasg., 1910, who had been summoned in May, 1940, on charges of advertising an ophthalmic service. At that hearing (*Lancet*, 1940, **1**, 1057) the charges had been found proved, but judgment had been postponed until this session. Dr. Matthews did not attend and was not represented, and the matter was discussed in camera.

The council also directed the erasure of the name of Arthur John Ireland, registered as of Stone Hurst, Tunstall, Staffs, M.C.P. & S. Ont., 1920, who had been convicted at the Chester Assizes of giving false information concerning a birth and of making a false statement in a notice required to be made by a public general Act of Parliament. This was the "Lady Haldon baby case." Dr. Ireland attended, accompanied by Mr. George Bankes, counsel, who pleaded on respondent's behalf that he had been deceived by his wife and had got nothing out of his false certificate. He was now in the R.A.M.C.

James Leslie Hill, registered as of 36, Chepstow Road, Newport, Mon., M.B. Edin., 1917, had been summoned to appear before the council as the result of a divorce action which had proved him guilty of adultery with a married woman, Gwenda Margaret Watson, with whom he had stood in professional relationship at all material times. Dr. Hill said in eyidence that the professional relationship had not begun until a year after the adulterous relationship. Mr. Oswald Hempson, solicitor, who represented him, submitted that for a registered medical practitioner to attend his mistress was not infamous conduct. Having considered all the facts, however, the council directed the erasure of Dr. Hill's name.

Richard Christopher Howard, registered as of 104, Harley Street, London, W.1, M.R.C.S. Eng., 1924, had been summoned to appear on a similar charge. The complainant, Mr. Hart-Davis, was accompanied by Mr. L. D. Woolfe, solicitor, who said that in the divorce proceedings, after the petitioner had given evidence that the doctor had on several occasions stayed at the petitioner's house during his absence and occupied the bedroom next to that of the wife, and had stayed with her at a Yorkshire hotel, the doctor had not further contested the case. His solicitors had admitted on his behalf the matters with which he was charged before the

council. Dr. Howard denied in evidence that he had committed adultery. The council directed that his name be erased.

An Educational Problem

The council heard an oral report from Col. H. L. TIDY, chairman of the Education Committee, of a complaint which had been received through the Board of Education from a joint committee of teachers in secondary schools. This committee stated that medical schools were limiting the number of students whom they would admit to the preclinical courses in anatomy and physiology on a higher school certificate, and were advising parents to send their children to a medical school directly after matriculation so that they would leave their secondary schools at 17 instead of continuing to the higher school certificate.

The objections the joint committee raised seemed, Colonel Tidy observed, to rest on different and inconsistent grounds. It first said that the proposal of the medical schools would, if carried out, have a harmful effect on sixth-form science work; then it criticised the recommendation of the medical schools that the boys should continue their general education between matriculation and entry to medical school (in accordance with a recommendation of the G.M.C.), saying that to do so would be a waste of time, that medical students ought to come to their medical studies as quickly as possible, and that to continue general education after matriculation affected their chances as candidates for State scholarships. The committee was therefore at the same time asking for assistance to prevent the medical schools from encouraging boys to enter immediately after matriculation, and complaining at the proposal that they should continue their general education. It overlooked that if a boy stayed at school to take the higher certificate he must occupy two years in chemistry, physics and biology; whereas at a medical school he could get through those subjects in a year. It was, in fact, asking to have it both ways. The G.M.C. decided not to intervene.

The Pharmacopœia

Dr. DAVID CAMPBELL, chairman of the Pharmacopœia Committee, said that sales of the B.P. 1932 had reached nearly 50,000. The third Addendum had become official at the beginning of this year; amendments had been made in it to conform with emergency action taken to conserve stocks of certain materials. A fourth Addendum, now in proof, would include amendments already made official, certain new monographs prepared for the next B.P., amendments relating to glycerin, and an appendix describing revised sterilisation procedures. The Pharmacopœia Commission, working in collaboration with the war emergency formulary committee of the Ministry of Health and the therapeutic requirements committee of the Medical Research Council, had prepared a further list of approved non-proprietary names for certain substances now being manufactured in Great Britain, and hoped that these names would be generally adopted. These names would be used in the B.P. for such substances as were later included.

CONGO DOCTOR.—Having spent what he regards as the most interesting ten years of his life as a missionary doctor in the Belgian Congo, Dr. W. E. Davis, an American, has written a lively and entertaining book about his experiences there. ("Congo Doctor." Robert Hale. Pp. 286. 12*s.* 6*d.*) Despite competition from witch-doctors he seems to have kept his end up pretty well, touring the country and injecting sufferers from yaws with neosalvarsan, training his own hospital teams of native boys and performing numerous feats of major surgery under primitive conditions at two dollars a time. Not every English or American surgeon would care to operate in a crazily built hut during a tropical storm and in almost total darkness when it may be necessary to lean over the laparotomised patient in order to keep the rain out of the peritoneal cavity. Dr. Davis modestly attributes his low operative mortality to the toughness of his patients, who if they can survive infancy can survive almost anything; but there must be more to it than that. He reproaches himself for idleness, but there is little evidence of it in this book, which describes a variety of extra-professional activities, including an elephant hunt, and is illustrated with some excellent photographs.

In England Now

A Running Commentary by Peripatetic Correspondents

IT was said that the late Lord Salisbury once described a certain daily as a paper published by office boys for office boys and further referred—which I beg leave to doubt—to the scientific weekly, which I will disguise as *Phusis*, as a journal edited by madmen for madmen. I wonder what the noble lord would have called a trade journal which has just come into my hands? Cecil Rhodes said that university dons are children in finance but any don who got hold of this journal I am talking about, assuming he could read it, might be excused for dubbing business men as children in their illusions. Just as children see their toy engines as stream-line locomotives, business men see the business which they have created or inherited as the chief pillar of the economic system. I remember strolling one day from the bacteriology department of a big works into the manager's lavatory to find nearly all the important members of the tablet-pressing department grinding up tablets of aspirin made by rival firms to see how they "took up" in water compared with the firm's own tablet. It was clear that things weren't going well. The firm's tablet refused to take up. "Dash it all," said the managing director, "our tablet must be the best. *We* make it." I don't know how it all ended; I left the firm shortly afterwards. But the memory has explained for me some of the more lurid advertisements I have read or the shortcomings of commodities I have too trustingly bought on trade descriptions. It is an optimist who believes the pictures on the seed packets. This train of thought was started by an article in this trade journal about the child's dilemma at the sweetshop, which seems to be "A penny ain't much good today. Might as well put it in the Spitfire collection." The writer suggests that the Government, which recently subsidised railways, public utilities and foods might "subsidise sweets for kiddies." Nor is this all. There is a full-blown article on the importance of cheap sweets from a nutritional viewpoint by two scientific blokes—one of them an "old friend of mine"—with more letters after their names than Goering has medals on his chest (or is it bosom?). And this article—all decked up in lovely terms such as disaccharides, carbohydrates, vitamins, reducing sugars and proteins—is out to show that "children have a craving for sugar, the intensity of which increases if this real want is not catered for." So a craving indicates a real want, does it? Ha! A little lower down, "Young children not only require a sufficiency of these various nutrients, but appear to have a special need for sugar, as opposed to starch." The real want has become a special need and there are further steps in the development of a craving into a necessity. All I can say is, this is most unfair to me. For forty years now whenever I have had a ticklish report to write I get a craving for sweets and cigarettes, and in the palmy days of peace I used to sit with a tin of sweets on one side of me and a box of cigarettes on the other. When my tongue got so plasmolysed with the sugar that it hurt I gave it a rest and started in on the cigarettes. When my pharynx was thoroughly kippered I went back to sweets. And so *da capo al fino*. I haven't been able to buy a boiled sweet or a cigarette for months and my temper and output have suffered. Do you think that I could get the appropriate journals to publish articles pressing on the Government the urgent need of providing cheap sweets and cigarettes for peripatetic correspondents? Well, why not? I've known the Ministry of Food do strange things in my time. But I'm afraid they will regard my craving for sweets and that of my juvenile fellow sufferers with a cold and unsympathetic eye.

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There is a good deal of human interest to be found in examining recruits at medical boards. Seated in no. 4 booth one afternoon I asked a young man, "Are you well?" "Yes," he replied politely, "how's yourself?" I realised then the wisdom of the chairman's invariable gambit which invites no such rejoinder. And his "You're very well, my man, aren't you?" can be counted on to strengthen weak hearts, white livers and trembling knees; it needs a brave or desperate neurotic

to disappoint him. The occupations of the recruits in an industrial district provide a catalogue of the myriad processes of modern industry. An odd and unexpected job is that of "caller-up." He is the engine-driver's alarm-clock. His whole occupation is to cycle from house-to-house waking engine-drivers and he must not leave until his quarry shows himself at door or window. A trichologist proved more puzzling until I noticed his look of professional pity for my sparsely covered scalp. "Hairdresser," I asked? "Hair-specialist," he replied. I remembered when, as a boy, I was trying to make conversation with the youth who was cutting my hair, and commenting on the emptiness of the shop said I thought barbers were always busy on Saturdays. "Barbers may be," he had told me, haughtily, "but hairdressers are not." From barber to hairdresser to trichologist; from clerk to stenographer to secretary; from undertaker to funeral-furnisher to mortician. It is natural that one should wish to magnify the dignity of one's labour, but too often the importance of the work varies inversely with the sonority of its title.

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The private doctor tries to do what is best for his patient; as a citizen he has a further duty to the community. If he becomes a state doctor he may find increasingly that the interests of his patient and of the community are not identical, for to the state the herd is more important than the individual. I sit in my garden and watch the silver balloons studding the blue sky. They denote for me a fractional increase in security over that my colleagues, equally virtuous and more distinguished, enjoy in a neighbouring city. Yet the balloons continue to protect my unworthy head because I live near a target which the Air Ministry judges to be of high value to the community. Take a clinical example. If I want to immunise a private patient against diphtheria I inject him with 0·2 c.cm. of alum-precipitated toxoid and some weeks later inject another 0·5 c.cm. Then, if my patient and I wish to be certain of his absolute immunity I determine, in three months time, that he is Schick-negative. If, however, I work for the state I give 0·1 c.cm., followed by 0·3 c.cm. and need not worry about the Schick test. The herd is primarily interested in protecting itself and if there is a certain percentage of Schick-negative individuals in the community diphtheria epidemics are baulked just as refractory muscle-fibres inhibit those waves of contraction that riot around the auricle. So a handful of Schick-positive reactors after immunisation makes no matter. Sometimes, of course, the interests of the community are identical with those of the individual (the Schick-negative person after state immunisation); often they embrace his interests in coincidental fashion (myself and the balloons); sometimes they are in partial conflict with the individual's good (the Schick-positive person after state immunisation); often, as in war, the community demands the extinction of the individual as the price of its own survival—i.e., absolute conflict. Medicine, like religion and art, places a high value on the individual. It may be difficult in a state medical service, but it should not be impossible, to reconcile these conflicting loyalties.

* * *

The disparity in the ratio of doctor to civilian-patients and doctor to service-patients arouses much comment. The difference between the 1 to 2500 and the 1 to 250 is too considerable to escape attention. There are reasons for the greater service needs which are self-evident; the Forces must provide for all possible emergency requirements; must allow of personal medical supervision and daily contact with a small group of men; and must spare a good margin of time for matters of organisation and routine (these forms in duplicate, in triplicate, in quadruplicate and even occasionally in quintiplicate). One interesting consideration arises: how many persons can one doctor be expected to look after in any sort of medical service—in health and in sickness, in prevention and cure, children and adults? My guess is 1500; and he should be expected to maintain a decent standard of clinical practice. Plans for 3000 patients to each doctor seem likely to debase our present performance rather than enhance it.

* * *

"They can't take this from us." It is thirteen years since I first heard this phrase and it was spoken by an old woman. She was seated on a kitchen-chair outside her back-door and in the shadow of her house. The day was Whit Monday and the sunshine was brilliant; the back yard was squalid but her gaze rested on the beauty of an apple tree in full bloom. "They can't take this from us." As I drove away I wondered who were "they." She was the widow of a patten-maker who had worked in the foundry at the bottom of the road. A foundry which had in the '80's made for its owner a fortune, a knighthood and a country estate. When work was plentiful, wages were good but in bad times even the skilled workmen, the old hands, were stood off. There were no retaining fees, no pensions, no sick pay and no workmen's compensation. It was the heyday of *laissez faire*. In good times and bad these thrifty, decent folk brought up their families; they were of necessity thrifty and decent since for those who were not there remained only the Poor Law. At any time sickness and unemployment and death, dread trinity of terror, might come upon them and they had no reserves. "They" then, were the forces of insecurity. Since there is little evil which has not its counterpart of good, their pleasures were simple and satisfying. Human relationships, religion, fruit-trees in blossom, a day's fishing, a few books—the things that could not easily be taken from them. The upper and middle classes in England, the millions of large and lesser Forsytes, had, for the most part, not known this vital insecurity for a hundred years. Not until 1940. France had fallen. The invasion was expected; property, stocks and shares, position, the family—all were threatened. I heard my phrase again, but on the lips of a different social class. A distinguished psychiatrist sat in my garden, looking beyond the apple trees, and said "A dispassionate observer would say the position was hopeless"; and then settling down more easily in his deck-chair, and bringing the apple trees into focus, he added, "But even the Nazis can't take this moment from us."

* * *

"How can my countrymen ever be civilised or even efficient," asked the Italian returning from America, "while they will call each other 'illustrissimo ingegnere' or 'eccellentissimo dottore'?" We in England congratulate ourselves on having escaped this extravagance as we have avoided the pompous rigmarole of Geheimsanitätsrat or Frau Professor Doktor. In fact we have gone to the other extreme of modesty where all parade of professional idiosyncrasies is excluded from social life. The lawyer leaves off his wig when he comes from court and the doctor hides his impedimenta in a bag that is no longer a tell-tale black. But while we keep styles and titles to a minimum in our talk, we spread them unrationed across envelopes. The harmless Dr. or Mr. of polite conversation is transformed into the meaningless vestigial appendage Esq. No one utters this mystic word. It carries no recognition of services rendered or qualifications achieved. The dictionary defines it as "an aspirant to knighthood." But write it we must every time we address a letter. The initials of a recognised diploma or decoration ought to be distinction enough without it. These days of general economy and plain dealing offer an opportunity for abolishing the fetish. Surgeons have so long been proud to remain plain "Mr." that they might set the example. Would not "John Hunter, F.R.C.S." look sensible, respectful and sufficient on the outside of an envelope?

* * *

The war is providing us with some conversational gambits. I was startled to hear a well-mannered friend remarking to a comparative stranger: "And how are you off for clothes?" A more matey comment came from a lady in the Mile End Road: "That's a nice bit of marg. you're wearing, ducky. How many coups did you give for that?"

ALERTS LET IN AIR.—At a large children's hospital the Ministry of Health, rightly raid-minded, has forbidden the use of any but ground-floor wards. This has led to much overcrowding, and members of the staff have been concerned about difficulties of ventilation. Thanks to one of the odd compensations of war these fears are misplaced. The matron gives it as her opinion that ventilation has never been better; as the nightly alert sounds the lights are put out and all the windows are opened to their fullest extent. It's an ill air where nothing's to be gained.

Letters to the Editor

RESEARCH IN THE E.M.S.

SIR,—The suggestion in your leading article that voluntary workers could be used in emergency hospitals to help in research has been amply confirmed by our experience. At the beginning of the war it was obvious that if all notes from our neurological unit were sent to the Ministry of Pensions uncopied much valuable research material would be wasted. Application was therefore made to the local Red Cross, V.A.D., and W.V.S. organisations, and they provided us, over a period of eighteen months, with about a dozen typists doing voluntary part-time work. Some of these, of course, have been transient. In all, the working hours they contributed amounted approximately to the services of one and a half full-time workers a week. They were placed under the supervision of the only full-time secretary provided for the neurological unit. As a result, at the end of the eighteen months, we have the complete records of some 2500 patients typed and filed. A typed copy has also been sent to the Ministry of Pensions; the doctor himself is allowed to keep his original notes for his private use.

Sutton, Surrey. LOUIS MINSKI.

CONGENITAL PYLORIC STENOSIS

SIR,—I am in complete agreement with Dr. Burnet when he says that a tumour is always present in pyloric stenosis. My paper dealt with that disease. It was concerned with the response obtained with Eumydrin in relation to hospital treatment, and its chief aim was to discover any way, other than trial and error, whereby it could be predicted how a given infant with pyloric stenosis would respond. Otherwise I would have made it clear that a tumour, so called, was palpated in every case in the report, not by one, but by two or more, observers. In every case, that is, but one. This child failed to respond to medical treatment and was successfully operated on. It seems I should have made this clear.

That pyloric stenosis can be cured by medical treatment was established before any satisfactory operation was devised, and of course long before eumydrin was used. To maintain otherwise is to suggest that the disease has for years been almost unknown in (say) Stockholm and Copenhagen, where on the other hand spasm is frequent; or that infants with "true" stenosis frequently present themselves at one children's hospital in (say) London, whilst at another a proportionate number come with pylorospasm, and that stenosis seldom occurs.

Atropine does, as Dr. Burnet suggests, indeed diminish spasm of the pylorus; and the hypertrophic condition of the muscle resolves. Rammstedt's operation also relieves the spasm. It does not, I am sure Dr. Burnet will agree, cure the hypertrophy, which as he says "may extend to the stomach and even the œsophagus"; yet the hypertrophy also resolves, and very quickly.

Whether the spasm should be relieved by medical or surgical interference is a matter of opinion, and often of judgment, and I have not found it one that can be determined by palpating the abdomen.

Harley Street, W.1. R. H. DOBBS.

SIR,—Recent articles by Helen Mackay and R. H. Dobbs on the treatment of congenital pyloric stenosis with Eumydrin raise two extremely important points for discussion—namely, the incidence of gastro-enteritis in children's hospitals, and the relative merits of eumydrin and operation in the treatment of the hypertrophied pylorus. It has been established that the death-rate among infants treated in hospital in this country with eumydrin is from 11 to 13%, but where eumydrin fails and operation follows the death-rate rises to a figure between 33 and 75%. The chief cause of death is given as gastro-enteritis. Where operation has been chosen as the method of treatment the death-rate varies from 0% in cases treated privately to as much as 25% in those treated in hospital.

In a series of 70 cases treated surgically during the past nine years at the Paddington Green Children's Hospital and the Willesden General Hospital by four surgeons including one of us (F. W. M. P.) there were 10 deaths, a mortality of 14%, and of these 6 were deaths from gastro-enteritis. The other causes of death were convulsions (2), bronchitis (1), and inanition (1). No surgical catastrophes such as hæmorrhage or peritonitis occurred. All the infants were operated upon under open ether anæsthesia.

We do not expect that all infants suffering from this condition will survive but we think that the death-rate could be kept at a very low level provided that (1) we can reduce the incidence of gastro-enteritis and (2) an unhurried preoperative preparation of about 48 hours is followed by a careful surgical technique. Coöperation between physician and surgeon has with us always been most intimate and is considered essential. There is no mystery in the Rammstedt operation nor is any exceptional skill required. Any good general surgeon should be able to obtain successful results as long as a few simple technical points are studied and followed.

The incidence of infective gastro-enteritis is a disgrace to our children's hospitals and the risk must be abolished. Possible ways and means are:

(1) Medical treatment at home.

(2) Discharge from hospital of operation cases as early as possible.

(3) Provision of separate rooms or cubicles with strict nursing precautions such as the use of masks and careful aseptic technique. The ideal of course is to have special day and night nurses.

During 1938 two glass enclosed cubicles were constructed for us at the Willesden General Hospital in the children's ward. Since then in 11 cases only one death has occurred. This is an encouraging sign and we believe with further experience we shall be able further to reduce the death-rate to 5% or less.

What is the future outlook in the two methods? After operation a healthy normal infancy and childhood is expected and follows. Can we be told of the late results of eumydrin treatment? Are these children more liable to gastric upsets and attacks of vomiting? Our own small experience of eumydrin has been disappointing and no case has as yet been made out for its enthusiastic adoption.

We do not believe such a condition as pylorospasm exists. It is a refuge diagnosis.

PEARSE WILLIAMS.
Wimpole Street, W.1. F. W. M. PRATT.

"SHOCK"

SIR,—In his interesting paper on civilian psychiatric air-raid casualties (*Lancet*, May 31, p. 686) Dr. Felix Brown says, "The symptoms in mild cases of shock are tremor, sometimes violent, dilated pupils, and tachycardia, with an emotional state of fear." . . . These symptoms are however the classic indications of fear, and in a later sentence Dr. Brown speaks of them as a "fear reaction." The treatment he prescribes (detailed history, reassurance, sedatives) is the treatment for frightened people. I suggest that it is undesirable to allow the word "shock" to become a medical diagnosis. The term "shock," without qualification, means an event not a condition; although when qualified by an adjective it may indicate a condition, as in "surgical shock." But "shock" or "nervous shock" as a diagnosis of a medical state possesses no medical precision and does not describe any condition for which other terminology is not available and more appropriate. "Bomb-shock" is another diagnosis which is now being freely used by medical practitioners. All these terms—which are being employed for a variety of mental states—are descendants of that unhappy family which included railway spine, traumatic neurasthenia and shell-shock, now largely deprived of their respectability. The cases described by Dr. Brown as "acute, emotional shock" are simply instances of excessive fear reaction, and they are occurring in some numbers. If the plain English is thought to be too cruel a description for them, I have elsewhere suggested the word "hyperphobosis" (ὑπερφοβος, terrified) as one which indicates the group of symptoms but, unlike the other terms, makes no implication as to their ætiology. It is an interesting thought that in former wars soldiers displaying this

condition ran the risk of being court-martialled and shot, while today they apply for pensions.

These observations are based upon the examination of cases (soldiers and civilians) suffering from the effects of air-raids, and on experience as a medical referee under the Workmen's Compensation Act.

London, S.W.1. WILLIAM A. BREND.

THORACOPLASTY

SIR,—Few will disagree with the general import of Dr. Hurford's paper (*Lancet*, May 31, p. 693) or with the statement in your leading article in the same issue that "thoracoplasty performed by skilled hands on patients who have been expertly selected for the operation does not carry such a terrifying mortality as many people have supposed"; nor can it be doubted that it allows the return to work of a large proportion of patients suitable for the operation who would otherwise shortly die. Without statistical examination, Dr. Hurford's apparently small numbers do not admit of any additional conclusions, but his paper and the leading article call for comment.

Dr. Hurford's cases show an operative mortality of 11% among 54 patients who underwent thoracoplasty for "parenchymatous" disease. But even this figure can be reduced, as is shown by R. H. Overholt's operative mortality (deaths within 3 months) of 2·2% among 490 thoracoplasty patients aged 17–39 (*Amer. Rev. Tuberc.* 1940, **41**, 143). Dr. Hurford is chary of recommending thoracoplasty for patients over the age of 40; of his 54 patients only 6 were over 35. Overholt gives results of thoracoplasty on 162 patients aged 40–65 (of whom 43 were over 50, and 4 over 60), with an operative mortality of 6·8%, and a late mortality, due to tuberculous disease, of 4%. After a period of 6–90 months, 71% were considered "apparently arrested" or "quiescent," and 13% more, improved; the sputum became negative in 87%. Of the cases selected for operation, 30% had active bilateral disease, and 14% presented complications. These figures can be left to speak for themselves. Your leader shows vision in recommending consideration of thoracoplasty at an earlier stage of the disease than has been the practice hitherto. But I feel you are divorced from pathological realities when you say that "most of the attention in selecting suitable patients is directed towards making sure that any active or exudative element is minimal." Are we really justified in speaking of any cavity with positive sputum as non-active or even as showing only "a minimal" active element? What is an exudative element? Is it not time the artificial distinction between "exudative" and proliferative disease, born of clinicians and seized upon avidly by surgeons, was decently buried? That the distinction can be carried to quite unjustified lengths is illustrated by Dr. Hurford's statement that the radiograms "in all cases except 1 showed proliferative changes, and most showed fibrotic elements as well; 12 (22%) showed exudative foci."

In spite of the work of Medlar and his co-workers, begun over 15 years ago, blood examinations do not appear to have caught on. Authors often speak of having found these examinations "useful" but little of scientific worth has been brought forward to substantiate these claims. The immunological aspects of tuberculosis are so complex that it would indeed be fortunate if a corpuscular ratio or a synthetic "index" were to give a true and concise picture of resistance (natural and acquired) or toxæmia. That these investigations may show which way the wind is blowing, that they require further study, and therefore that their practice should be encouraged cannot be denied; but this is a far cry from allowing the blood picture by itself to cause postponement of collapse therapy or influence rejection of a surgical measure. Dr. Hurford speaks (rather lukewarmly, I thought) in favour of blood examinations in choosing patients for thoracoplasty; he admits that the erythrocyte-sedimentation rate has never seemed so useful as the full examination, but thinks it has some value. But the table he gives, presumably in support of this statement, indicates that the sedimentation-rate by itself is just as useful as the von Bonsdorff count and Houghton index. Later in the paper he says that in two or three cases operation was indefinitely deferred because the blood of the patients "seemed unduly poor"; and that he now feels they should have been given the benefit of thoracoplasty. One can only heartily endorse his conclusion that: "though a patient should of course be made as fit as possible before operation, there may be a peak of improvement beyond which his disease will not allow him to rise, and at that point no laboratory figures should be allowed to offset the clinical indications for thoracoplasty."

Your leader, while drawing attention to blood examinations, omitted to mention another, perhaps more important, factor in choosing patients for thoracoplasty. Investigation of the cardiovascular system is essential, not only in the older age-groups, and should not be perfunctory. Tuberculosis physicians and surgeons are also realising the importance of investigating fully the functional reserve of the lungs, both in regard to their respiratory and their gaseous-exchange functions (Kaltreider, N. L., Fray, W. W. and Philips, E. W. *J. thorac. Surg.* 1938, **7**, 262; Harter, J. S., Overholt and Perkin, H. J. *Ibid*, p. 290; and Lambert, A. V., Berry, F. B., Cournand, A. and Richards, D. W. *Ibid*, p. 302). These investigations are likely to be particularly valuable since the method of bronchospirometry, introduced by Jacobæus several years ago, enables each lung to be examined separately (Zavod, W. A. in *J. thorac. Surg.* 1940, **10**, 27 and 32). It is to be hoped that surgical units for the treatment of pulmonary tuberculosis will in future concentrate at least as much on this work as on the more nebulous blood pictures.

Staines. G. GREGORY KAYNE.

RENAL LESIONS RESULTING FROM SULPHATHIAZOLE

SIR,—It has been pointed out that while there is a rational basis for the administration of alkali during the course of therapy with sulphanilamide, no such rationale exists for the use of alkali during therapy with sulphapyridine or sulphathiazole.[1] This statement is true insofar as the production of acidosis is concerned, for neither sulphapyridine nor sulphathiazole will produce the alkali loss known to follow the administration of sulphanilamide.[2 3] It fails, however, to take into account one important physical property of these drugs: they are more soluble in neutral or slightly alkaline media than in acid media (see table).

AQUEOUS SOLUBILITY OF SULPHATHIAZOLE AND ACETYLSULPHATHIAZOLE IN RELATION TO pH AT A TEMPERATURE OF 37° C.

† pH = Potentiometric. Sul. = Sulphathiazole. Asul. = Acetylsulphathiazole.

† pH	Aqueous solubility (mg./100 ml.) at 37° C.		† pH	Aqueous solubility (mg./100 ml.) at 37° C.	
	Sul.	Asul.		Sul.	Asul.
5·08*	97	..	6·6 **	113	8·8
5·29*	96	..	6·8 **	125	10·9
5·31*	..	6	7·0 **	140	13
5·52*	98	6·4	7·1 **	163	..
5·74*	99	6·6	7·18**	..	16·5
5·84*	97	..	7·24**	200	..
6·02**	96	6·9	7·38**	214	..
6·2 **	99	6·8	7·5 **	234	..
6·4 **	106	7·3	7·6 **	244	31·2

* Phthalate buffer system. ** Phosphate buffer system.

The practical importance of the increased solubility of these compounds as the pH of the menstruum approaches neutrality or becomes alkaline is of the highest order. One of the principal toxic reactions of sulphapyridine and sulphathiazole is their tendency to form calculi in the renal tract with a resultant interference with renal function. Antopol and Robinson,[4] and Gross and his colleagues[5] have shown that such lesions may be produced experimentally by the administration of sulphapyridine and that they are fundamentally

1. Long, P. H., Haviland, J. W., Edwards, L. B. and Bliss, E. A. *J. Amer. med. Ass.* 1940, **115**, 364; Long, Personal communication.
2. Southworth, H. *Proc. Soc. exp. Biol.* 1937, **36**, 58.
3. Beckman, W. *J. clin. Invest.* 1938, **17**, 538.
4. Antopol, W. and Robinson, H. *Proc. Soc. exp. Biol.* 1939, **40**, 428; *Arch. Path.* 1940, **29**, 67.
5. Gross, P., Cooper, F. B. and Lewis, M. L. *Proc. Soc. exp. Biol.* 1939, **40**, 448; *Urol. and Cutan. Rev.* 1939, **43**, 429.

due to the accumulation of precipitated acetylsulphapyridine in the form of uroliths which may cause complete obstruction of urinary excretion. In the case of sulphathiazole we have shown[6] that the renal lesion which results from the continued administration of massive doses of this drug to animals (*Macacus rhesus*) is a result of the precipitation of the drug in the renal parenchyma. The picture of the essential pathology is that of a series of small acute inflammatory reactions surrounding acellular foci which contained crystalline material. This crystalline material has been isolated and identified as a mixture of sulphathiazole and acetylsulphathiazole, the former compound predominating.

The urine of patients given large doses of certain sulphonamide compounds not infrequently contains masses of insoluble crystals, and there have been numerous reported cases in which this type of toxic reaction has caused serious disturbance[7] or even death.[8] The damage to the renal parenchyma following the continued administration of excessive doses of 1 or more g./kg./day of sulphathiazole to normal monkeys may be aptly ascribed to physical traumatisation of the tissues rather than to any chemotoxic action of the drug; the traumatising agent being the crystals of sulphathiazole which have precipitated in the collecting tubules. We have repeatedly observed collecting tubules with normal epithelium both proximal and distal to a small zone of acute inflammation in which the epithelium has been completely eroded or which has undergone severe degenerative changes. The central portions of such inflammatory zones invariably contained small deposits of crystalline material.

Our experimental work, for the most part, was carried out on adult *M. rhesus* monkeys, kept in isolated cages and fed on a normal diet. Five such animals received a dose of 1 g./kg./day of sulphathiazole by stomach-tube. The dose was divided into three equal parts and administered at 8-hour intervals. Daily blood samples were taken for the determination of the drug content midway between the morning and afternoon doses. Periodic samples were analysed for non-protein nitrogen, A second series of five animals were treated in the same way except that they were given 1 g./kg./day of sulphathiazole and 1 g./kg./day of sodium bicarbonate. In both series medication was continued for 28 days.

Four of the five animals in the first series died during the course of medication. All of these animals showed a large terminal rise in the concentration of the drug in the blood which was associated with a large rise of the N.P.N. values. These deaths occurred on the 7th, 10th, 13th and 28th days of medication respectively. Autopsy showed severe inflammatory lesions of the renal tract involving the renal medulla, cortex and pelvis, the ureters and the bladder. These lesions have already been described in detail. In the second series no untoward effects were observed and all animals survived 28 days of medication. N.P.N. values at all times were within previously established normal limits. In two animals of this group sacrificed on the 29th day no macroscopic lesions could be found and histological examination revealed only very slight generalised parenchymatous degeneration. No acute lesions were observed. The detailed protocols of this experiment will appear in the near future.[6]

The great differences between the pathological picture evoked by this dose of sulphathiazole when administered alone and in conjunction with a maintained alkaline regimen cannot be attributed to a diminished absorption of the drug from the gastrointestinal tract with a resultant lowering of the blood concentration. As we have shown in an earlier communication[9] the administration of alkali with sulphathiazole increases the rate of absorption of the drug in both animals and man, and produces a higher blood concentration than that which results from the administration of the same quantity of the drug alone. This finding was borne out in the present study: those animals on the sulphathiazole and bicarbonate regimen showed a generally higher blood concentration than those on sulphathiazole alone.

In our opinion, the striking difference in the renal lesions in the two series can only be attributed to an increased solubility of the drug in the slightly alkaline urine resulting from the administration of the bicarbonate, which is sufficient to prevent the precipitation of the drug in the renal parenchyma and thus maintain the integrity of renal function, in spite of excessive medication.

Winthrop Chemical Company, Inc., New York. D. R. CLIMENKO. O. W. BARLOW.

GASTRIC ACIDITY IN INFANCY

SIR,—No conclusions can legitimately be drawn concerning the physiology of gastric secretion from Miller's recent investigations which you annotated on May 10 (p. 605). For some reason he analysed the resting juice only. Free acid is absent from the resting juice of a large proportion of normal people, and it is absurd to conclude that its absence indicates that a baby —or an adult—has achlorhydria. In 117 consecutive test-meals given at the Radcliffe Infirmary there were 17 cases of complete achlorhydria, half of them in patients with anæmia or carcinoma of the stomach. Of the remaining 100, in all of which free acid was present in some of the patients, exactly 50 had no free acid in the resting juice. This is what one would expect from Bennett and Ryle's[1] observations in healthy medical students, which showed that only 4 per cent. had complete achlorhydria, whereas 50 per cent. had no free acid in the resting juice. The secretion of acid occurs in response to the biochemical and psychological effects of taking food; consequently in the absence of food free acid is frequently absent in normal people.

Oxford. ARTHUR F. HURST.

RAPIDLY DEVELOPING SILICOSIS

SIR,—I am appreciative of your comments (*Lancet*, March 29, p. 422) on my review of so-called acute silicosis. In your brevity, I may add, you have more succinctly reviewed this subject than I had in several pages. There is, however, a misinterpretation of my statement that: "These metastatic lesions are foci of macrophages, which do not show the typical histology of silicotic nodules and may be areas of reticulo-endothelial hyperplasia rather than true metastases." I was unable to study these foci by the micro-incineration method to prove or disprove their silicotic origin. I did not wish to imply that previously reported metastatic foci were not typical adult silicotic nodules. This correction should have been made before it went to press; however, at the time I did not see this implication.

Tuberculosis Hospital, Cincinnati, Ohio. ROBERT RITTERHOFF, Director of Laboratories.

CASUALTY ORGANISATION BY THE HOME GUARD

SIR,—Dr. Gordon Ward's admirable letter illuminates a situation which has not hitherto received attention from the profession or the public, and now calls for a sympathetic response. There is, however, one sentence which is misleading. He says "I do not include the Emergency Medical Service because this is a hospital service." It is true that it is often convenient to speak of the emergency hospital organisation as the E.M.S., just as it is to speak of the first-aid (or stretcher) party service, the first-aid post service and the emergency street-ambulance service collectively as the A.R.P. casualty services. The distinction has a genuine constitutional significance, because the Minister of Health has a direct statutory responsibility for the hospital organisation whereas the local authorities have the primary responsibility for the other services. But for practical purposes it is essential to consider them all as "Emergency Medical Services" and parts of a single operational machine, including incidentally the inter-hospital ambulances and the casualty evacuation trains. From the point of view of the casualty, the important thing is that all those who handle him from the scene of the incident to his discharge from hospital should be conscious links in a single organisational chain. The

6. Climenko, D. R. and Wright, A. W. *Arch. Path.* (in press).
7. Southworth, H. and Cook, C. *J. Amer. med. Ass.* 1939, **112**, 1820.
8. Taso, Y. F., McCracken, M. E., Chen, J., Kuo, P. T. and Dale, C. L. *Ibid*, 1939, **113**, 1317; Koletsky, S. and King, B. G. *J. lab. clin. Med.* 1940, **25**, 1021.
9. *J. Amer. med. Ass.* 1941, **116**, 282.

1. Bennett, T. I. and Ryle, J. A. *Guy's Hosp. Rep.* 1921, **71**, 286

unity of the whole organisation is recognised in the position of the D.G. E.M.S., who is an officer of both the Ministry of Health and the Ministry of Home Security and responsible as such not only for the central medical direction of all the services mentioned but also for the first-aid training of the whole of the A.R.P. services. No doubt the War Office, the headquarters of Home Defence Services, and the Ministry of Health are in close communication on all aspects of this problem, but it is important that the members of the profession and others whose help is rightly solicited should appreciate the position of the E.M.S.

AN INTERESTED PARTY.

ATYPICAL PNEUMONIA

SIR,—In a recent leading article (May 17) on atypical pneumonia, and in particular on acute pneumonitis, you omitted to mention that in this country the condition was first described by A. M. Gill (*Middlesex Hosp. J.* 1937, **37**, 20). In his second paper (*Brit. med. J.* 1938, **1**, 504) Gill called attention to certain differences between acute pneumonitis and disseminated focal pneumonia as described by Scadding and it is probable that the two names are not synonymous as you suggest.

London. CHRISTOPHER HARDWICK.

POSTWAR HOSPITAL SERVICES

SIR,—My experience in the Emergency Medical Service since the outbreak of war has provided what my pathetically scientific mind considers to be an interesting control experiment on the very debatable problem of the organisation of our municipal hospitals. In September, 1939, I was sent to a county-council hospital where along with my colleagues, all of us from a well-known teaching hospital, I was treated with the utmost contempt by a medical superintendent who not only considered himself a superb administrator but had also an overwhelmingly high opinion of his surgical, medical and obstetrical capacities. No job was considered too menial for us to do; not a tithe of respect was paid to our clinical opinion, and any suggestion from us, no matter how politely expressed, was automatically turned down. The Sector Officer was sympathetic to our oft-repeated complaints but helpless in the face of the childlike faith which the M.O.H. of the county had in his medical superintendent. Ultimately, however, and by degrees we all found ourselves in more congenial surroundings, convinced that whatever our lot might be after the war we would starve rather than go anywhere near a hospital run by that local authority. On the other hand some of us still felt that it was not fair to condemn the whole system of municipal hospitals simply on this one experience and that it was the man and not the machine that was to blame.

Some months later I found myself transferred to yet another hospital run by the same authority, but this time everything in the garden seemed to be lovely. The medical superintendent was a product of a well-known famous teaching hospital and had received the appointment without any previous experience of council hospitals. Now we would be able to demonstrate how a hospital could be run with a whole-time staff each with our own beds but sharing our good "cases" and having joint consultations just when and where they were considered necessary. Not for us would be the disturbing factor of a "dictator" altering our treatment without consulting us or discharging patients when he periodically made a complete round of the hospital. And so it began—but alas our hopes were doomed to early disappointment. Ere long bureaucracy with a capital B appeared on the scene. Our superintendent became more and more autocratic in his ways; where, originally, we had been consulted before any new policy was adopted we gradually found that the decision was taken without consultation. "Dud cases" were admitted to our beds while his beds tended to collect the cream of the admissions; patients were examined in our absence and their treatment changed; patients were discharged without our knowledge; even one's own outpatients were admitted to someone else's beds. We were back in the bad old days of the early months of the war, with the added insult that it was all so unexpected.

The one consolation is that it has been an interesting experiment, and the tentative conclusion I draw is that it is the machine that is at fault and not necessarily the man. If the hospitals of the future are to be run on the basis of a whole-time medical staff, then the one essential is that the medical superintendent must be purely an administrator with, of course, charge of a few beds of his own should he wish to maintain his clinical interest. But—and this is the point which I wish to stress—he must have no jurisdiction over the beds allotted to members of his staff. These must be of a standard sufficiently high to be entrusted with complete medical, surgical and obstetrical care of their patients, and the medical superintendent must have no control over them. An administrator is undoubtedly necessary, and for such an administrator a medical training is essential; but the general policy of the hospital on the clinical side must be in the hands of a committee consisting of all the senior members of the staff. The medical superintendent would probably act as chairman of this committee, but his only right of veto would be on the grounds of expense; and in this connexion the medical committee would have the right of appeal to the medical officer of health for the area. Very few men granted complete power over the medical staff could perform their duties without deteriorating. A man who knows that the full legal responsibility is his and who is the servant of a lay public-health committee is almost bound to adopt dictatorial methods.

OBSERVER.

RESISTANCE OF THE NEW RECRUIT

SIR,—I have lately seen your extracts of Colonel Bensted's Harben lectures, and I should like to raise a point or two in connexion with the difficulties of mass immunisation.

It seems important that we should know whether the immunity mechanism works as a whole, and can only be either wholly stimulated or wholly depressed; or whether it works in a locular sense, so that when a strain is thrown on one compartment it does not necessarily impair the function of another. Perhaps we should first decide whether existing basal immunities are like thrown-off products, with a separate existence, or whether they depend for maintenance on the well-being of the body. Solution of these questions might help us to know whether, by making repeated calls on the system for antibodies (enteric, diphtheria, tetanus) we were running any risk of depressing resistance to a disease like cerebrospinal fever. This disease seems to be peculiarly associated not merely with warfare but with new recruits in a military camp. I agree with Fairbrother that fatigue in soft material is probably a potent cause of generally depressing a recruit's resistance. But I suggest that undue fatigue, falling in the fortnight after each dose of a T.A.B. inoculation, is the combination that does the real damage. We focus all our attention on the immediate toxic reactions of a vaccine in the first 48 hours and tend to forget that the immunity mechanism is under strain for at least a fortnight after that. Herein may lie the explanation of the new recruit datum. The high incidence of virus diseases with pneumonic complications in these men might be explained in the same way.

In Natal the medical command elected to use a concentrated detoxicated extract of T.A.B. organisms for all recruits. The antigen concentration of this extract works out at about eight times that of the familiar T.A.B. vaccine containing 2000 million organisms per c.cm. These men could all be considered good material and accustomed to sport, yet the sickness-rate of the camps was so great that the press took it up, and there was an inquiry. In one camp of 7000–9000 men there were 70 cases of cerebrospinal fever, and influenzal pneumonia was equally prevalent. The military medical authorities held, and do hold, that this amount of sickness could be adequately explained by a combination of low resistance of new recruits, some unavoidable shortcomings of accommodation, very cold weather, the effect of dust, and the general tendency for infection to spread in camp circumstances. They have great faith in the vaccine used, for it has been tried out extensively in mine natives for some years. One of the chief advantages claimed for this extract is that it produces hardly any local or general reaction, though my experience in this regard has been unfortunate. Here, however, we have an eloquent example of the resistance of new recruits breaking down,

and I feel that route-marching with full pack and an over-zealous sergeant-major during physical drill, coming in the fortnight after inoculation, may well lie at the root of the matter.

Where is this concentration of dosage to end? Do we use 2000 million organisms per c.cm. in a suspension vaccine because we are afraid to go bigger on account of toxic reactions, but would gladly do so if we could? Do we want to go for a larger and larger harvest of blood agglutinins, or are such big agglutinin figures obtained at the expense of some other more valuable antibodies? We know that they tend to subside rather quickly. In nature the stimulus is seldom large and sudden, but usually mounts from a small beginning, and we might well take a leaf out of nature's book and begin with a very small sensitising dose. The mechanism may actually have two kinds of response, depending on the dose and the spacing; or one to multiple small stimuli, and another to a sudden large stimulus. I shall not be surprised if further research shows that three smaller doses, longer spaced, give a better working protection, though less humoral evidence of such, than our present shock tactics. And during the time the immunity is being built up we may gain some advantage by giving an extra ration of vitamin C and guarding against undue fatigue. In mass immunisation, three doses are of course difficult, but if we are going to combine several antigens it might be advisable not to embark on the job until we have gone somewhat deeper into these questions. In particular we want more light on, first, the effect on general immunity of placing the mechanism under strain to a particular antigen; secondly, on whether the immunity mechanism has more than one type of response, for example, a sudden quick subsiding and a slower more durable; thirdly, on the effect of fatigue after inoculation; fourthly, on the relation between poor response and shortage of vitamin C; and finally, on whether the two-big-shots method gives us the best type of result for public-health purposes.

Durban, South Africa. B. F. SAMPSON.

FRIENDLY FOREIGN DOCTORS

SIR,—May I as a Czechoslovak doctor express my opinion regarding your leading article and Prof. Greenwood's letter of May 31? Most of us who came to this country did not intend to settle down here and compete with British doctors, but we thought of this country as a temporary refuge where we could wait for an opportunity to go overseas. When the war broke out our intentions altered with the prospect of returning home after a victorious end and eagerly we offered our services to this country. I can appreciate the view that British medical training differs in some respects from the continental, and I do not think that we should be able to fulfil immediately all the duties of a resident medical officer, especially with regard to writing up records and prescriptions; the English anæsthetic technique is also different from ours.

All this speaks against the employment of foreign doctors but there are also arguments in our favour. Every one of us is anxious to fulfil his medical duties and adopt your ways and will try to accustom himself to the best of his ability. Those of us who have surgical experience will soon be able to assist again. The same applies to ether-narcosis, to which we are used. Most of us have years of experience in private practice which will certainly enable us to make a better diagnosis than a beginner. May I suggest a short period of training in the British ways of hospital work to overcome existing difficulties? You can be assured of our readiness to help.

When we return home at the end of the war many things which we have seen and learned here should form a basis for friendly collaboration, both political and scientific. AN ALLIED DOCTOR.

The June number of the *Proceedings of the Royal Society of Medicine* will contain in the section of medicine a discussion on the nature and treatment of the effort syndrome by Dr. H. J. Starling, Dr. Paul Wood and Dr. Maxwell Jones, and in the section of psychiatry a paper by Dr. Aubrey Lewis on psychiatric aspects of effort syndrome. These two reports will also be issued as a combined reprint (1*s.* post free from the editorial office, 1, Wimpole Street, London, W.1).

Medical News

University of Oxford

The Rockefeller Foundation have made a grant of £900 to the Nuffield department of surgery to pay the salaries of Dr. Eric Guttmann and a trained social worker in psychiatry. Dr. Guttmann is to carry out an investigation into brain injuries.

The university is making a grant to the department of biochemistry to carry out a nutritional survey and a study of antiseptics in relation to burns.

University of Cambridge

On June 6 the degree of M.D. was conferred by proxy on J. O. Poynton.

University of Manchester

A second week-end course on health in the factory will be held at the medical school on June 28 and 29. The course, which has been arranged in collaboration with the Association of Industrial Medical Officers, is intended for medical practitioners. Further particulars will be found in our advertisement columns.

Society of Apothecaries of London

At recent examinations the following, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery and midwifery:

R. M. Ellison, Leeds; W. H. Morgan, Cardiff; S. G. L. Klein, St. Mary's; A. L. H. Smith, Guy's; N. A. St. C. Marley, Guy's; O. Sookias, Camb. and Bart's; G. H. Miles, St. Mary's; W. J. U. Tin, Lond. Hosp.

Among those appointed to the distinguished service order for gallantry in the withdrawal from Greece is Surgeon Lieutenant A. G. Campbell, M.B., R.A.N.R.

Since publication of the last list of subscriptions to the Medical War Relief Fund over £1400 has been received.

A meeting of the Paddington Medical Society will be held at 8.45 P.M. on Tuesday, June 17, at St. Mary's Hospital, W.2, when Dr. G. de Swiet will give his presidential address on the place of the doctor in the community of tomorrow.

On Thursday, June 19, at 4 P.M., Mr. J. Ramsbottom, D.Sc., will give a Chadwick lecture at the Chelsea Physic Garden, Swan Walk, S.W.3. He will speak on the inter-relation of man and fungus in health and disease.

A lecture on the nature of the self will be delivered to the British Institute of Philosophy by Prof. H. H. Price, at 14, Gordon Square, London, W.C.1, on Friday, June 20, at 5 P.M. Tickets can be had on application to the director of studies, at that address.

On Thursday, June 19, at 5 P.M., at the section of neurology of the Royal Society of Medicine, Squadron-Leader Denis Williams will read a paper on electro-encephalography in trauma to the brain. On June 20, at 4 P.M., at the section of physical medicine Dr. Philippe Bauwens will discuss the thermionic control of electric currents, and at 5 P.M on the same day at the section of ophthalmology Mr. T. M. Tyrrell will speak on war injury of the eyes.

In the *Times* of June 6 it is reported that Mr. Dudley Wright, consulting surgeon to the London Homœopathic Hospital, and his wife are prisoners in Germany. Mr. and Mrs. Wright were on board the *Zamzam* which was sunk on April 17.

Dr. J. C. Martin, secretary of the Irish Medical Free State Union, has resigned his post on his appointment as registrar to the Irish branch of the General Medical Council. Dr. Martin was the first medical secretary of the union, which now has 934 members, and his efficiency and courtesy have contributed largely to its success.

The following have been appointed to the council of the Imperial Cancer Research Fund for the ensuing year: chairman, Prof. H. R. Dean, F.R.S.; vice-chariman, Sir Cuthbert Wallace; Elizabeth Wills Allen fellow, Dr. L. Foulds; and Alice Memorial fellow, Mr. R. J. Ludford, D.Sc. Prof. James Young has been appointed a governor of the fund by the Royal College of Surgeons of Edinburgh, and Prof. T. J. Bosworth, D.V.S.M., by the Royal Veterinary College and Hospital.

Obituary

ROBERT PERCY SMITH

M.D. LOND., F.R.C.P.

Dr. Percy Smith, consulting physician for mental diseases to St. Thomas's Hospital, died at Durley, Southampton, on June 4, at the age of 87. He qualified from St. Thomas's in 1878 and took his M.B. with gold medal the following year. Further study in Vienna and house-appointments at his own hospital prepared him for his specialty and he was early appointed resident physician at Bethlem Hospital where his chief was Sir George Savage. The two men were poles apart in character and temperament. The senior was sparkling, original, an arresting and dramatic personality who blamed himself for dissipating his energies; the junior was calm, concentrated, as precise in mind as he was neat in appearance—a type of mind embarrassing to the glib, superficial, and self-assured, for whom indeed Smith frankly had no use. But those who worked with him knew his quality, and Dr. Edwin Goodall, one of his clinical assistants in the mid-'eighties, writes: "Under Smith no slackness or slovenliness was allowed in our rounds or records. With others I suffered occasional reproofs, which were merited and gently administered by a gentleman. He was firm but not austere and had a saving sense of humour."

As a teacher at Charing Cross and later at St. Thomas's Smith was eager to enhance the prestige of his specialty, and in 1910 he was among those who urged the Royal College of Physicians to institute a diploma in psychiatry. For many years he examined for the University of London, and he was president of the then Medico-Psychological Association in 1904 and of the section of neurology and psychiatry of the R.S.M. during the last war. His mind was critical rather than original, and he had no bent for research. He excelled in clinical work, while his writings on the Insane and the Law, Defects in the Working of the Lunacy Act, Voluntary Boarders in English Asylums reflect his interest in administrative problems.

For many years Percy Smith was in consulting practice, yet it is impossible to picture him as the conventional Harley Street specialist. Conscientious and fair-minded, yet not wanting in sympathy, he was there to advise those who preferred an opinion of ungarnished honesty.

WILLIAM GRAY

M.B. EDIN., M.CH. ORTH. LPOOL, F.R.C.S.E.

William Gray was killed in one of the recent raids on Liverpool. He came from Vancouver Island, where his father is a doctor, to Edinburgh for his medical education, qualifying in 1932. After acting as house-surgeon at the Edinburgh Royal Infirmary, he held several house-posts elsewhere, and then studied for the M.Ch. Orth. at Liverpool in 1938. A year later he gained the Edinburgh fellowship, and then came back to Liverpool as resident surgical officer, deputy medical superintendent and orthopædic surgeon at Mill Road Infirmary, a post which he held until his death at the age of thirty-three.

Drummond Shiels, Edinburgh

A competent general surgeon, Gray's work in orthopædics was most promising. Straightforward, open and solid, he made his mark on the life of the infirmary in the comparatively short time he was there. His consultant seniors were glad to have his reliable and cheerful help; and he had a genius for making his juniors in "the house" feel part of the hospital family. With natural and unassuming kindness he took them under his wing, and before they had been long there, they were "Bill" and "John" and "Arthur" and it was good to hear them in the residents' room eager to discuss their patients with him and to have his help in the varied problems that assail a houseman. He did splendid work for casualties of the raids. Though not officially on duty, he was on his way to give a hand with the casualties of a heavy raid when he was killed instantly. His wife, whom he married only last autumn, was formerly a sister at the infirmary.

HUGH EMRYS BONNELL

B.SC. WALES, M.R.C.S.; MAJOR, R.A.M.C.

Major H. E. Bonnell was killed last month by enemy action at the age of 35. In 1925 he took his B.Sc. with first-class honours in physics at the University College of South Wales and Monmouthshire, and began work in the physiological department of the college. There he soon became interested in medicine, and he qualified from King's College Hospital, London, in 1931. He took up pathology as his specialty at once, and held appointments at K.C.H., Manchester and Hastings, before he became pathologist at the East Ham Memorial Hospital and consulting pathologist to Runwell Hospital, Wickford. This wide experience made him an excellent practical pathologist, and in a busy hospital his quick grasp of essentials stood him and everyone concerned in good stead, while his early scientific training in the physiological department at Cardiff made his opinion on questions of research valuable. R. S.-O. writes: Bonnell's bluff nature and strong sense of humour won him many friends particularly among his younger colleagues. He was staunch and loyal and it is difficult for those who knew his vitality and love of life to be reconciled to the tragedy of his death.

Dr. JOHN GERALD ROGERS, who was killed last month at a London hospital during an air-raid, was educated at St. Edward's College, Liverpool, and the University of Liverpool, where he took his M.B. in 1935. After holding house-appointments at the Northern Hospital and at Mill Road Infirmary he came to London to work under the London County Council. He was thirty years of age.

Public Health

From the Annual Reports

BIRMINGHAM

Dr. James R. Mitchell presents the school report for 1940. Birmingham, like Manchester, has a school medical department separate from that of the M.O.H. In peace-time the comparison of the school work of the two cities was always of interest, and their war-time difficulties are doubtless similar, but we must not compare the report of Birmingham for 1940 with that of Manchester for 1939. Dr. Mitchell gives details of the scheme for medical inspection and follow-up of children about to be evacuated; but in November, 1940, as a result of enemy action, the "carefully prepared plans" came to grief—as most of us expected that they would. Birmingham found it impossible to lend its staff to the reception areas but arranged for temporary assistance to be provided on the city's charge. In spite of the exceptional difficulties of the times, the school medical department kept up its work. In 1940, spectacles were prescribed for 2580 children, of whom 2485 obtained them. The error of refraction for which spectacles are most often ordered is hypermetropic astigmatism; of 1266 children refracted and spectacles advised, 576 had this error. Next in frequency are simple hypermetropia and myopic astigmatism, of which there were 297 and 239 cases respectively. At the ultraviolet-ray clinic 1498 children were treated for various conditions, of whom 485 were cured, 529 improved, 27 showed no change and 457 defaulted. In smoky cities there may be no natural actinic light for many months of the year, so that we look to them for evidence of the effect on health of

absence of light, and to their clinics for proof that the ill health attributed to absence of light is really so caused. The results of the Birmingham clinic suggest that there is no disease caused solely by poverty of actinic rays, but that it is an important accessory in the production of some pathological states. Of 336 cases of "bronchitis and asthma" 112 were cured, and this proportion of cures is common to most conditions for which children receive light treatment. It would not be justifiable to attribute the cure to the treatment, but the experience of recent years confirms the value of ultraviolet light in smoky towns, though it does not support the exaggerated claims made for it when it was introduced. In the orthopædic department only 83 children with rickets, but 40 of spastic paraplegia, were seen among 723 cases. Dr. C. L. C. Burns, the director of the child-guidance clinic, says that there have been few cases where war conditions have been an important contributory factor to behaviour disorders; but it has been noticed, and confirmed by teachers, that after air-raids there is an increase of excitability and aggressive behaviour and diminished powers of memory and concentration; this is an expected physiological response in mentally healthy children. Only 36 children with "evacuation problems" were seen at the clinic of whom 11 had enuresis and 9 were stealing cases. Dr. Burns says that he is "beginning to get the child of 7-plus who has missed a great deal of school and is now very backward in his school lessons. It seems likely that there will be a considerable number of children retarded owing to this reason, and suffering emotionally from the consequent anxiety."

Infectious Disease in England and Wales

WEEK ENDED MAY 31

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1114; whooping-cough, 4121; diphtheria, 886; enteric fever, 101; measles (excluding rubella), 13,031; pneumonia (primary or influenzal), 1161; puerperal pyrexia, 132; cerebrospinal fever, 254 (London 16, Liverpool 12, Birmingham 10); poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 3; dysentery, 113; ophthalmia neonatorum, 82. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on May 28 was 1846, including scarlet fever, 231; diphtheria, 337; measles, 398; whooping-cough, 430; enteritis, 11; chicken-pox, 80; erysipelas, 57; mumps, 7; poliomyelitis, 2; dysentery, 24; cerebrospinal fever, 47; puerperal sepsis, 10; enteric fevers, 10; german measles, 15; other diseases (non-infectious), 93; not yet diagnosed, 94.

Deaths.—In 126 great towns there was no death from smallpox, 2 (0) from enteric fever, 1 (0) from scarlet fever, 29 (3) from whooping-cough, 11 (1) from measles, 17 (1) from diphtheria, 24 (1) from diarrhœa and enteritis under 2 years, and 24 (2) from influenza. The figures in parentheses are those for London itself.

Burnley and Hull each reported a death from enteric fever. There were 3 fatal cases of whooping-cough at Liverpool, and in the same week Glasgow reported 11.

The number of stillbirths notified during the week was 186 (corresponding to a rate of 35 per thousand total births), including 16 in London.

Parliament

Shared Homes

TODAY very few Englishmen have their castles to themselves, for as Mr. JAMES GRIFFITHS pointed out in the discussion in the House of Commons, there are now five kinds of evacuees—official ones, unofficial ones, the services, war workers, and a fifth group, which he described as emergency evacuees. These people are the concern of no less than ten government departments, and at present there is often more competition than coördination about billeting arrangements. He thought the burden of reception often proved too heavy for the smaller local authorities and suggested that the county council might be a better unit of organisation. Sympathy and understanding are needed if these townsfolk are to be made welcome in the county, and if need be fish and chips must be elevated to a place among the social services. Dr. HADEN GUEST thought it unfair to ask a woman to choose to break up her home. Evacuation should be made compulsory in certain areas. He thought the scandal of social conditions revealed in the early days of evacuation was a healthy shock to the nation. Many tributes were paid to the kindness and tolerance shown by hosts and guests but Mr. D. KIRKWOOD was less satisfied and said it was easy for the cultivated mind to make excuses. Mr. E. BROWN who spoke early in the debate said that revolution was being changed into evolution, and the word "impossible" amended by "nevertheless." "Plan," "region," "compulsion" and "coördination," he averred, were fine words but they did not solve any problems—and to the delight of the House Mr. Brown became very fierce. In all the Government had requisitioned 27,402 houses in England and Wales,[1] and though some of the younger guests had turned out to be tough guys Mr. Brown thought on the whole we had done fairly well. He had always found the smaller councils very efficient. Mrs. MAVIS TATE urged the need for an overhaul of our rural water-supplies, and pointed out that the housewife seems to dislike sharing her kitchen more than her home. Mr. G. STRAUSS was distressed that so many children were still to be found in public shelters. He thought that enough use was not made of the power to evacuate children on medical grounds, for instance in the first three months after its inception only about twenty children were sent away. He also urged that the chronic sick should all be got out of London. Mr. T. JOHNSTON, who summed up, paid a tribute to the goodwill and courage that had been shown, but said we must remember that it was impossible to cope with the problem on peace-time standards. He thought nowadays that no-one had any more right to two houses than to two rations of butter.

1. 2906 houses for London mothers and children; 21,726 for the homeless; 233 for unorganised refugees; 344 for difficult children; 132 for school-children (there are also 30 camps under the National Camps Corporation); 166 for maternity homes; 209 for sick bays and infectious hospitals.

LOOKING AFTER THE UNDER-FIVES

THE growing disturbance of family life by the war has increased the need to provide suitable accommodation for young children, and the Minister of Health and the President of the Board of Education have decided to set up jointly war-time nurseries both for evacuated children and for the children of women war-workers, whether evacuees or local residents.[1] Maternity and child-welfare authorities will be responsible for the arrangements and should send their proposals to the senior regional officer of the Ministry of Health. Education authorities and billeting authorities will coöperate in the scheme. According to the local needs variations of two main types of nurseries will be provided. Part-time nurseries will provide for the care and training of children between the ages of 2 and 5 and will be open during school hours under the direction of a teacher. Whole-time nurseries will give full day-time care and maintenance to children of all ages up to 5 in districts where mothers are in full-time employment. These nurseries will be open for 12–15 hours a day and will provide meals and facilities for bathing and resting; and there will be trained nursing staff under the direction of a matron who will be a fully trained (general or children's hospital) nurse. But the activities and social training of the children of 2–5 will be supervised by a teacher. At whole-time nurseries where children receive all their meals the mothers will pay 1*s.* a day; at part-time nurseries where no meals are provided payment will be 3*d.* a day, and another 3*d.* where a midday meal is given. No payment will be asked from evacuated mothers who are not in employment and cannot afford to contribute, and apart from these contributions the Government will pay for the nurseries. Arrangements will be made by the medical officer of health for the regular medical inspection and supervision of the children.

1. Ministry of Health, circular 2388; Board of Education, circular 1553.

At the annual meeting of the Faculty of Radiologists on May 23, Lord Horder and Prof. Henry Cohen were admitted to the honorary fellowship.

Notes, Comments and Abstracts

"THE BEHAVIOUR OF NATIONS" [1]

Mr. Morley Roberts has long been recognised as a distinguished writer of fiction. Twenty-one years ago he wrote "Warfare in the Human Body," in which he suggested that problems facing students of that most marvellous of living organised communities, the human body—problems of disease and health, of malignancy, immunity, inhibition, heredity, cell-division, evolution, growth, repair and old age—had their parallels and analogues in organised human societies. In this he was not going beyond his province, for, as Sir Arthur Keith pointed out in the foreword, Mr. Roberts is "endowed with a vast share of intellectual curiosity and gifted with the diagnostic acumen of the born physician." Medicine could do with more such suggestive contributions from competent laymen; but inference based on analogy has its dangers.

In his new book Mr. Roberts has treated some of his own inferences as basic facts and used them to explain national and international relations. He is a self-acclaimed disciple of Thomas Hobbes; if people could be induced to read "Leviathan," he says, they need hardly trouble to read "The Behaviour of Nations." In so saying, he underrates both Hobbes and himself. "The Behaviour of Nations" lacks Hobbes's philosophic calm, his "genial sarcasm," and his absence of personal prejudice. "Leviathan," on the other hand, lacks Mr. Roberts's intolerant, yet often amusing and sometimes deserved, invective. No two conceptions of the nature of a community or of a nation could be less alike than are the harmonising sovereign Leviathan of Hobbes and the "very low-grade invertebrate organisms" which Mr. Roberts alleges that states "really and not metaphorically" are. Given these premises, the author's pessimism is natural enough. Mutual distrust would seem to be the only wisdom. He believes that the less differing nations know of each other the better, because fewer points of contact mean fewer opportunities for conflict. Our modern diplomatic forms, he considers, are based on the instincts of our cannibal ancestors, and warns us that: "all converse of friendship among nations is dangerous. There are no friends among nations."

It is true enough that only by the sovereignty of the general will, whether delegated for a period to one or to many individuals, can peace within a nation or between nations be secured and enjoyed. Readers who may infer from this book that permanent peace between nations is a ridiculous ideal, impossible of attainment, should recall the early history of this country, and should also bear in mind that the self-preservative is not the only "natural," or inherent, impulse of man.

AN EAST END HOSPITAL CARRIES ON

THE Salvation Army Mothers' Hospital is actually doing more work than it was before the war, though not all in London. Fifty beds—half the usual number—are being kept open in the wards at Clapton, and seventy-six additional beds have been lent at places in Derbyshire and Northamptonshire. The mothers are taken off by train or charabanc when the time of delivery approaches, and some of them have even been found billets in those safer regions later. At the hospital in London a bomb destroyed two valuable modern wards and left standing the older houses, ear-marked for demolition. This has not proved incapacitating, however. Mothers delivered in the wards are transferred nightly to the air-raid shelters and brought back to their beds in the morning. Visiting husbands, usually on leave, and fire-watchers—business men who never fail in this voluntary duty—help to move the stretchers and carry down the babies. District work goes on; the midwives from the hospital have had plenty of experience of deliveries in Anderson shelters or bombed houses by this time, often going to their cases through streets in which shell fragments, not to say bombs, are falling. The transfer of beds to ground floor living rooms has added to the difficulties of conducting a confinement in the East End home. One of the nurses sums it up as a return to the conditions of twenty years ago. At least the rebuilding of London should make it possible to end those conditions for good when peace comes. The Mothers' Hospital is in need of £18,000 to meet current liabilities. Those wishing to contribute should send donations to General George L. Carpenter, 101, Victoria Street, London, E.C.4.

FROM SHEEP TO SURGERY

MEDICAL biography, both factual and fictitious, has had a pretty good innings recently, and in his latest book Mr. Harley Williams finds himself batting on a rather worn wicket. "Fingal's Box" (Jonathan Cape. Pp. 382. 8*s*. 6*d*.) is the story of a young New Zealand sheep-farmer who sells out and comes to Edinburgh to read medicine in the years immediately after the last war. Coming under the influence of an eccentric and boorish pathologist he finds his allegiance divided between surgery, his first love, and research on the influence of the endocrines on tumour growth. Somehow he contrives to reconcile the three, and the story ends with him, still in early middle age, making a name for himself as a surgeon-pathologist. He has, of course, his ups and downs and also some love affairs, the last and most genuine of which almost causes his professional downfall, but not quite. Mr. Williams knows what he is talking about and handles even the hackneyed theme of the strange habits of medical students with a certain freshness. If he does not always avoid being needlessly and irritatingly melodramatic in describing the commonplaces of surgery, his numerous characters are well and surely drawn, and his long novel sustains its interest to the end.

1. By Morley Roberts. London: J. M. Dent and Sons. 1941. Pp. 80. 12*s*. 6*d*.

Appointments

ASHWORTH, ALAN, M.D. Lpool, D.T.M., D.P.H.: M.O.H. for Mitcham.
BLUNT, ELEANOR, M.B. Lond., D.R.C.O.G.: M.O. in maternity and child-welfare department of Birmingham.
EASTWOOD, C. G., M.D. Manc., D.P.H.: M.O.H. for Weston-super-mare.
*GOODWIN, M. A., M.B. Leeds: temp. asst. R.S.O. at Withington Hospital, Manchester.
HUGHES, T. LLOYD, M.D. Lpool, D.P.H.: M.O.H. for Barnsley.
MELVILLE, JAMES, M.B. Camb.: asst. R.M.O. at Winchester Emergency Hospital.
MOORE, Sir ALAN, Bt., M.B. Camb., D.P.H.: M.O.H. for Rye.
O'SULLIVAN, J. J., M.B. N.U.I.: temp. asst. R.S.O. at Crumpsall Hospital, Manchester.
SHAPIRO, ALEXANDER, M.B. Lond.: temp. second asst. M.O. at Middlesex Colony, Shenley.
SPITZER, WALTER, M.D. Prague, M.R.C.S.: resident obstetrician at Kingston County Hospital.
VELLACOTT, H. D. S., M.B. Camb.: senior asst. R.M.O. at Alton Hospital.

* Subject to confirmation.

Births, Marriages and Deaths

BIRTHS

DIXON.—On June 3, at Eynsham, Oxon, the wife of Squadron-Leader F. W. Dixon, F.R.C.S., R.A.F.—a daughter.
FITZGIBBON.—On June 8, at Wrington, Somerset, the wife of Mr. G. M. FitzGibbon, F.R.C.S.—a daughter.
GILCHRIST.—On June 2, at Stanmore, Middlesex, the wife of Squadron-Leader G. Gilchrist, M.B., R.A.F.—a son.
KING.—On June 3, at Skegness, Lincs., the wife of Surgeon Lieutenant R. E. King, R.N.V.R.—a son.
LACE.—On June 5, at Porthcawl, the wife of Captain E. J. Lace, R.A.M.C.—a daughter.
PRATT.—On June 5, at Fulmer Chase, the wife of Flying-Officer Noel J. Pratt, R.A.F.V.R.—a daughter.

MARRIAGES

AYLWARD—MUNRO.—On June 5, at Tunbridge Wells, Roy Douglas Aylward, M.R.C.S., to Effie Campbell Munro.
BOLTON—MITCHELL.—On May 26, at Alexandria, Reginald Bolton, major, R.A.M.C., of Beaconsfield, to Dorothy Mitchell of Iffley, Oxford.
FIELD—WOOD.—On June 7, at Great Gaddesden, Philip Charles Field, M.R.C.S., lieut.-colonel R.A.M.C., to Alice Ava Wood.
MILLING—TODD.—On June 9, at Wimbledon, Peter Francis Milling, M.R.C.S., to Euphemia Margaret Todd.
RONALD—SPALDING SMITH.—On June 2, at Fairlie, James Ronald, M.D., surgeon lieut.-commander R.N.V.R., to Joan Spalding Smith.
RUSBY—BROADHEAD.—On June 7, at Nottingham, Norman Lloyd Rusby, D.M., to Elizabeth Broadhead, M.B.

DEATHS

SMITH.—On June 4, at Durley, Southampton, Robert Percy Smith, M.D. Lond., F.R.C.P., of Albion Street, W.2, aged 87.